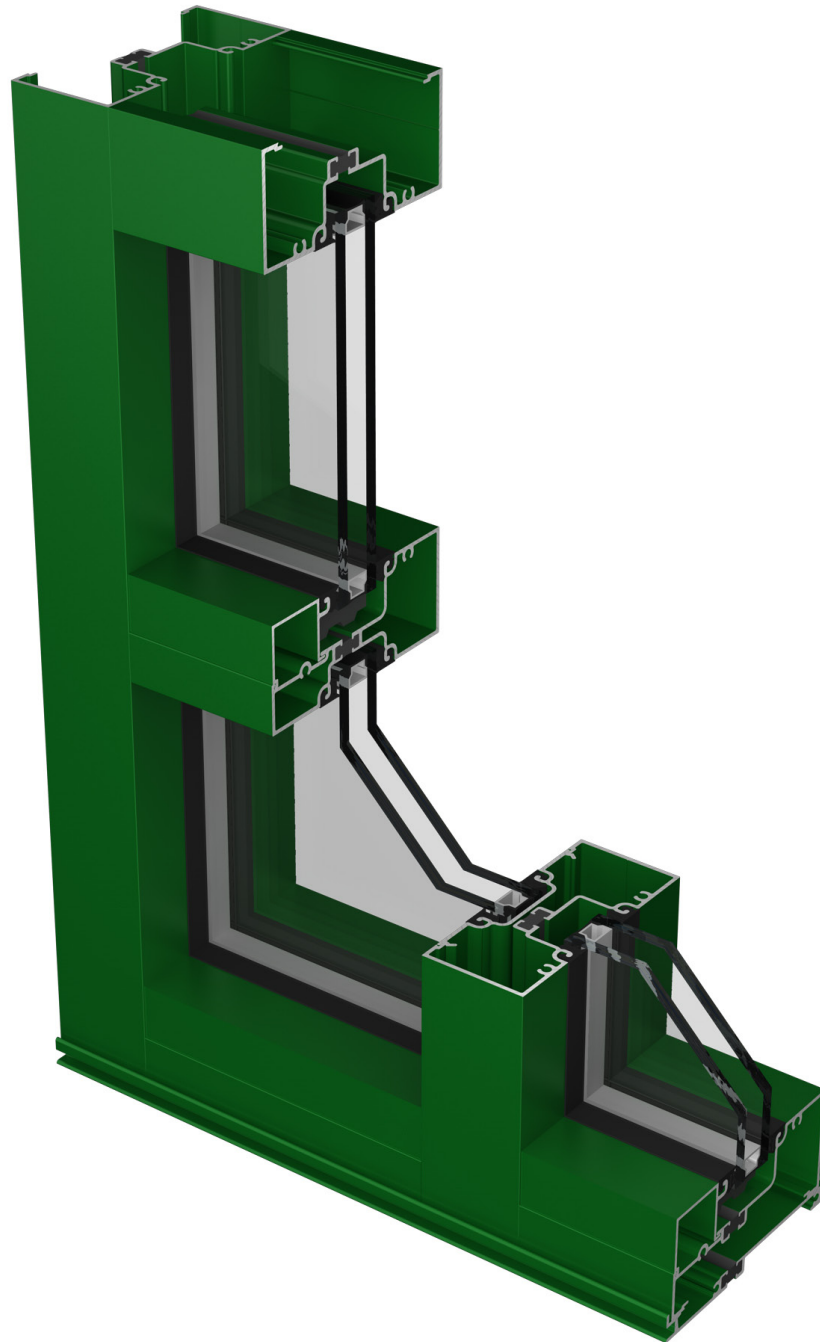


# TUBELITE®

**DEPENDABLE**

LEADERS IN ECO-EFFICIENT STOREFRONT,  
CURTAINWALL AND ENTRANCE SYSTEMS



## 14000 SERIES STOREFRONT

# INSTALLATION INSTRUCTIONS

3056 Walker Ridge Dr. NW, Suite G • Walker, MI 49544 • 800-866-2227



## TABLE OF CONTENTS


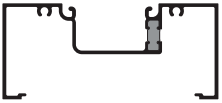
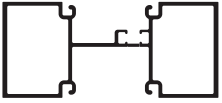
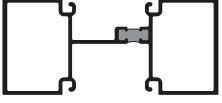
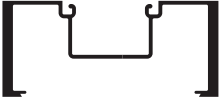
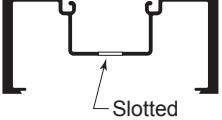
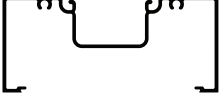
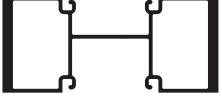
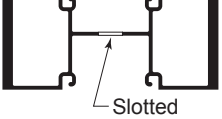
<b>GENERAL CONSTRUCTION NOTES</b> .....	<b>5</b>
<b>PARTS LIST</b> .....	<b>6-18</b>
<b>QUICK REFERENCE CHECKLIST</b> .....	<b>19</b>
<b>ELEVATION DETAILS</b> .....	<b>20-22</b>
<b>FRAME FABRICATION</b>	
Step 1      Determine Frame Size .....	<b>23</b>
Step 2      Cut Material to Length .....	<b>23</b>
Step 3      Sill Flashing .....	<b>24</b>
Step 4      Verticals & Closer Pockets for Horizontals .....	<b>25-26</b>
Step 5      Horizontals for Shear Block Assembly .....	<b>27</b>
Step 6      Shear Block Modification .....	<b>28</b>
Step 7      Steel Stiffener .....	<b>29</b>
<b>FRAME ASSEMBLY</b>	
Step 8      Sill Flashing End Dams .....	<b>30</b>
Step 9      Optional High Sidelite Base .....	<b>31-33</b>
Step 10     Assemble Frames .....	<b>34-36</b>
Step 11     Gasket Installation .....	<b>37</b>
<b>FRAME INSTALLATION</b>	
Step 12     Sill Flashing Installation .....	<b>38</b>
Step 13     Sill Flashing Splicing .....	<b>39-40</b>
Step 14     Install Frames .....	<b>41-42</b>
Step 15     Frame at Entrance .....	<b>43</b>
<b>GLAZING</b>	
Step 15     Glazing Preparation .....	<b>44</b>
Step 16     Installing Glazing Units .....	<b>45-46</b>
<b>CORNER CONDITIONS for 90° &amp; 135°</b>	
Step 1      Sill Flashing Fabrication & Installation .....	<b>47-49</b>
<b>CORNER CONDITIONS for ROTATIONAL MULLION</b>	
Step 1      Sill Flashing Fabrication & Installation .....	<b>50-51</b>
<b>NARROW SIDELITE BASE</b>	
Step 1      Fabrication & Installation .....	<b>52</b>
<b>INSIDE GLAZE</b>	
Guidelines:   Screw Spline & Shear Block Assembly .....	<b>53-54</b>
<b>OPTIONAL THERMAL ENHANCEMENT</b>	
Details:      Alternate Details .....	<b>55</b>






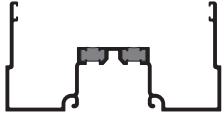
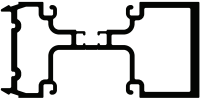
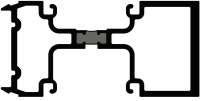
## GENERAL CONSTRUCTION NOTES

1. These instructions cover typical product application, fabrication, installation and standard conditions and are general in nature. They provide useful guidelines, but the final shop drawings may include additional details specific to the project. Any conflict or discrepancies must be clarified prior to execution.
2. Materials stored at the job site must be kept in a safe place protected from possible damage by other trades. Stack with adequate separation so materials will not rub together and store off the ground. Cardboard or paper wrapped materials must be kept dry. Check arriving materials for quantity and keep a record of where various materials are stored.
3. All field welding must be done in accordance with AISC guidelines. All aluminum and glass should be shielded from field welding to avoid damage from weld splatter. Results will be unsightly and may be structurally unsound. Advise general contractor and other trades accordingly.
4. Coordinate protection of installed work with general contractor and/or other trades.
5. Coordinate sequence of other trades which affect framing installation with the general contractor (e.g. fire proofing, back up walls, partitions, ceilings, mechanical ducts, HVAC, etc.).
6. General contractor should furnish and guarantee bench marks, offset lines and opening dimensions. These items should be checked for accuracy before proceeding with erection. Make certain that all adjacent substrate construction is in accordance with the contract documents and/or approved shop drawings. If not, notify the general contractor in writing before proceeding with installation because this could constitute acceptance of adjacent substrate construction by others.
7. Isolate all aluminum to be placed directly in contact with masonry or other incompatible materials with a heavy coat of zinc chromate or bituminous paint. Fasteners attaching framing to building structure are typically not provided by Tubelite. Note: Use only flat head fasteners at head and jamb conditions.
8. Sealant selection is the responsibility of the erector, installer and/or glazing contractor and must be approved by the sealant manufacturer with regard to application and compatibility for its intended use. All sealants must be used in strict accordance with the manufacturer's instructions and applied only by trained personnel to surfaces that have been properly prepared.
9. Sealant must be compatible with all materials with which they have contact, including other sealant surfaces. Consult the sealant manufacturer for recommendations relative to shelf life, compatibility, cleaning of substrate, priming, tooling/adhesion, etc. All surfaces coming in contact with waxes or oils through the fabrication or assembly process must be cleaned to assure proper adhesion of sealant.
10. Drainage gutters and weep holes must be kept clean at all times. Tubelite will not accept responsibility for improper drainage as a result of clogged gutters and weep holes.
11. This product requires clearances at the head, sill and jambs to allow for thermal expansion and contraction as well as construction tolerances. Refer to final distribution drawings for joint sizes. Joints smaller than 1/4" may be subject to failure. Consult the sealant manufacturer for proper sizing of joints.
12. All framing members, entrances and other materials are to be installed plumb, level and true with regard to established bench marks, column center lines or other working points established by the general contractor and checked by the erector, installer and/or glazing contractor.
13. After sealant is set and a representative amount of the wall has been glazed (500 square feet or more), run a water hose test to check installation. On large projects, a hose test should be repeated during glazing operation. This testing should be conducted in accordance with AAMA 501.2 specifications.
14. Cleaning of exposed aluminum surfaces should be done per AAMA recommendations.
15. Check [www.tubeliteinc.com](http://www.tubeliteinc.com) for any installation instruction updates.

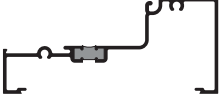

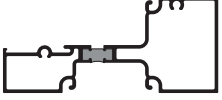

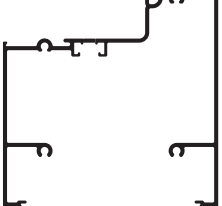
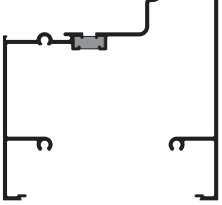
**VERTICAL EXTRUSIONS**

SHAPE	DESCRIPTION	PART No.
	Standard Open Back Head/Jamb/Vertical	<b>T14441</b>
	Open Back Vertical Mullion for Steel Reinforcement	<b>T14261</b>
	Tubular Vertical Mullion (Non-Thermal)	<b>E1400</b>
	Tubular Vertical Mullion (Thermal)	<b>T1400</b>
	Open Back (Non-Thermal) Heavy Duty Vertical Mullion	<b>E1435</b>
	Open Back (Thermal) Heavy Duty Vertical Mullion	<b>T1435</b>
	Open Back (Non-Thermal) Head/Jamb/Vertical	<b>E14141</b>
	Heavy Duty (Non-Thermal) Tubular Vertical Mullion	<b>E1430</b>
	Heavy Duty (Thermal) Tubular Vertical Mullion	<b>T1430</b>

## VERTICAL EXTRUSIONS

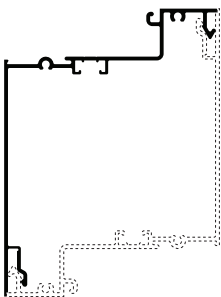
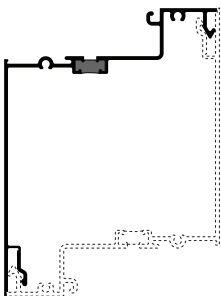

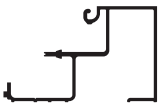
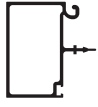
SHAPE	DESCRIPTION	PART No.
	Female Half (Non-Thermal) Expansion Mullion	<b>E14106</b>
	Male Half (Non-Thermal) Expansion Mullion	<b>E14107</b>
	Female Half (Thermal) Expansion Mullion	<b>TU24346</b>
	Male Half (Thermal) Expansion Mullion	<b>TU24336</b>
	Sun Shade (Non-Thermal) Vertical Mullion	<b>E14249</b>
	Sun Shade (Thermal) Vertical Mullion	<b>T14249</b>

**HORIZONTAL EXTRUSIONS**

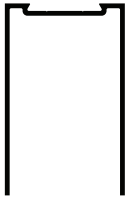







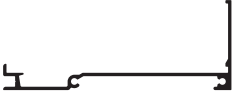
SHAPE	DESCRIPTION	PART No.
	Open Back Horizontal/Sill	<b>T14240</b>
	Open Back Horizontal/Sill	<b>E14140</b>
	Standard Tubular Horizontal/Sill	<b>T14143</b>
	Tubular Horizontal/Sill	<b>E14103</b>
	4½" x 4½" (Non-Thermal) Horizontal/Sidelite Base	<b>E14047</b>
	4½" x 4½" (Thermal) Horizontal/Sidelite Base	<b>T14047</b>



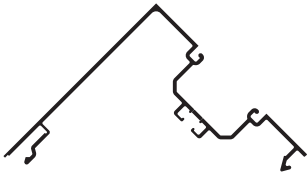
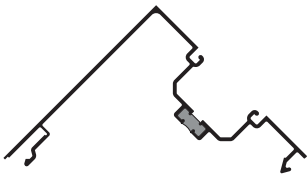
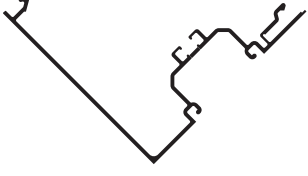
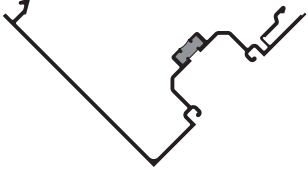
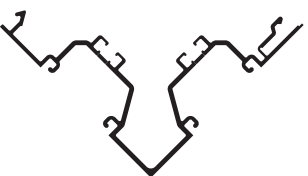
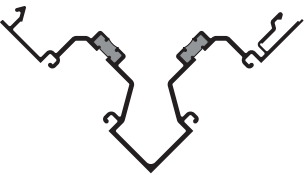
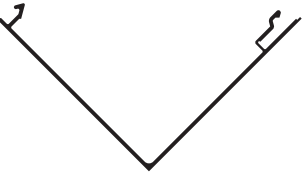
## HORIZONTAL EXTRUSIONS

SHAPE	DESCRIPTION	PART No.
	<p>4½" x 6" (Non-Thermal) Self Mating Horizontal</p>	<p><b>E14054</b></p>
	<p>4½" x 6" (Thermal) Self Mating Horizontal</p>	<p><b>T14054</b></p>
	<p>Horizontal Glass Stop</p>	<p><b>E14104</b></p>
	<p>Perimeter Member for Curving <i>Used with P1707 clip</i></p>	<p><b>E14288</b></p>
	<p>Perimeter Face for Curving</p>	<p><b>E14289</b></p>

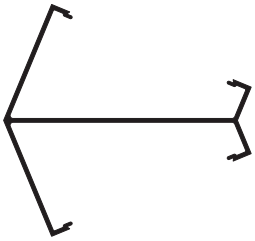
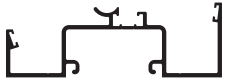
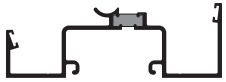


**SIDELITE BASE, SILL FLASHING  
and HEAD RECEPTOR EXTRUSIONS**

SHAPE	DESCRIPTION	PART No.
	4" x 2½" Sidelite Base	<b>E14026</b>
	Sidelite Base Anchor Shoe	<b>E14027</b>
	Head Receptor	<b>E45116</b>
	Head Receptor (Non-Thermal)	<b>E14129</b>
	Head Receptor (Thermal)	<b>T14129</b>
	Head Receptor Snap Stop	<b>E14130</b>
	Sill Flashing	<b>T14259</b>
	Sill Flashing	<b>T14055</b>
	Sill Flashing	<b>E14059</b>





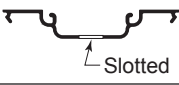











## CORNER EXTRUSIONS

SHAPE	DESCRIPTION	PART No.
	<p>90° Single Pocket Corner Mullion Half (Non-Thermal)</p>	<p><b>E14118</b></p>
	<p>90° Single Pocket Corner Mullion Half (Thermal)</p>	<p><b>T14118</b></p>
	<p>90° Single Pocket Corner Mullion Half (Non-Thermal)</p>	<p><b>E14119</b></p>
	<p>90° Single Pocket Corner Mullion Half (Thermal)</p>	<p><b>T14119</b></p>
	<p>90° Duel Pocket Corner Mullion Half (Non-Thermal)</p>	<p><b>E14110</b></p>
	<p>90° Duel Pocket Corner Mullion Half (Thermal)</p>	<p><b>T14110</b></p>
	<p>90° No Pocket Corner Mullion Half</p>	<p><b>E45110</b></p>


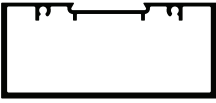


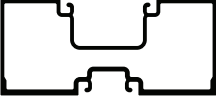
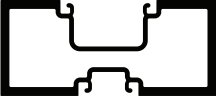
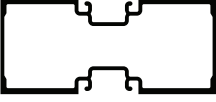
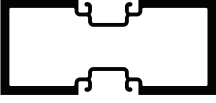
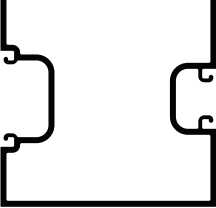
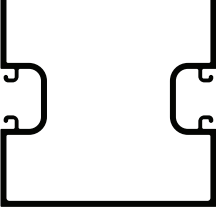
**CORNER EXTRUSIONS**

SHAPE	DESCRIPTION	PART No.
	<p>45°/135° Corner Mullion Post</p>	<p><b>E45005</b></p>
	<p>Rotational Corner Mullion Half (Non-Thermal)</p>	<p><b>E14246</b></p>
	<p>Rotational Corner Mullion Half (Thermal)</p>	<p><b>T14246</b></p>
	<p>Rotational Corner Mullion Post (Non-Thermal)</p>	<p><b>E14247</b></p>
	<p>Rotational Corner Mullion Post (Thermal)</p>	<p><b>T14247</b></p>




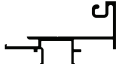
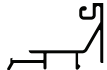


## POCKET FILLERS and GLAZING ADAPTOR EXTRUSIONS

SHAPE	DESCRIPTION	PART No.
	Flat Snap-In Filler	E4543
	Flat Snap-In PVC Filler	P4543
	Flat Snap-In PVC Filler	P4543A
	Closer Pocket Filler	E14445
	Closer Pocket Filler Slotted	T14445
	Closer Pocket Filler	T14442
	Closer Pocket Filler (Alternate) See page 55 for usage	A244040
	Deep Closer Pocket Filler	E14022
	Deep Closer Pocket Filler	T14022
	Deep Closer Pocket Filler (Alternate) See page 55 for usage	A245050
	Snap-In Sidelite Base Adaptor	E14248
	Snap-In Sidelite Base Adaptor	T14248
	Snap-In 1" Pocket Filler	E1411
	Snap-In 1" PVC Pocket Filler	P4563
	Snap-In 1/4" Glazing Adaptor	E14036
	Snap-In 1/2" Glazing Adaptor	E14061








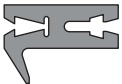
**DOOR FRAME EXTRUSIONS**

SHAPE	DESCRIPTION	PART No.
	Standard Tubular Door Header	<b>E14124</b>
	Tubular Door Header	<b>E14125</b>
	Open Back Center Hung Door Jamb	<b>E1438</b>
	Open Back Door Jamb	<b>E14144</b>
	Tubular Door Jamb	<b>E14021</b>
	Heavy Duty Tubular Door Jamb	<b>E14121</b>
	Tubular Intermediate Door Jamb	<b>E14145</b>
	Heavy Duty Tubular Intermediate Door Jamb	<b>E14245</b>
	4½" x 4½" Tubular Door Jamb	<b>E14250</b>
	4½" x 4½" Tubular Intermediate Door Jamb	<b>E45009</b>

## DOOR FRAME ACCESSORIES EXTRUSIONS

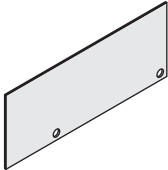
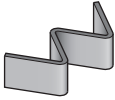
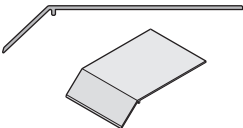

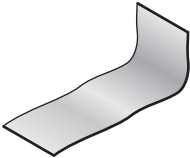
SHAPE	DESCRIPTION	PART No.
	Snap-In Door Stop	<b>E4531</b>
	Offset Arm Cover Door Stop	<b>E2298</b>
	Applied Transom Gutter	<b>E1414</b>
	Snap-In Transom Gutter	<b>E4013</b>
	Snap-In Transom Gutter	<b>E14024</b>
	Gutter Glass Stop for E1414 & E4013	<b>E1415</b>
	Gutter Glass Stop for E14024	<b>E14025</b>

**GASKETS and SETTING BLOCKS**





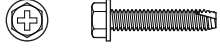
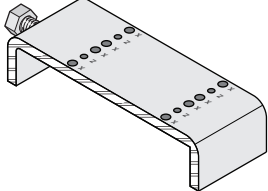
SHAPE	DESCRIPTION	PART No.
	Roll-In Glazing Gasket for 1" Glass (Standard)	<b>P2728</b>
	Roll-In Glazing Gasket for 1 1/8" Glass	<b>P487</b>
	Roll-In Glazing Gasket for Undersized Glass	<b>P2428</b>
	Finger Gasket for E45116 (Equal Leg Head Channel) and E14246 (Variable Angle Corner Mullion Half)	<b>P1221</b>
	Bulb Gasket for Two Piece Head Channel E14129/T14129 (Base Channel Member) E14130 (Snap-In Channel Stop)	<b>P2511</b>
	3/16" Setting Block at Inside Glaze Horizontals Only	<b>P2400</b>
	Setting Block (Standard)	<b>P1131 (Silicone)</b> <b>P1132 (EPDM)</b>
	Face Clip for E14288 & E14289	<b>P1707</b>




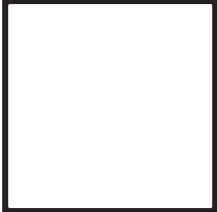
## WATER CONTROL ACCESSORIES and DRILL GUIDE

SHAPE	DESCRIPTION	PART No.
	<p>Sill Flashing End Dam</p>	<p><b>P1153</b></p>
	<p>EPDM AntiWalk "W" Block (Optional) (Use at Deep Pockets on Verticals and Jamb)</p>	<p><b>P1916</b></p>
	<p>Water Diverter (Use at Intermediate Horizontals)</p>	<p><b>P1135</b></p>
	<p>Aluminum Splice Sleeve (Use at E14059, T14055 and T14259 Sill Flashing)</p>	<p><b>P1144</b></p>
	<p>Silicone Splice Sleeve - (Optional) (Use at E14055, T14055, E14259 and T14259 Sill Flashing)</p>	<p><b>P3444</b></p>

**SYSTEM SCREWS**

SHAPE	DESCRIPTION	PART No.
	#10 X 1 <sup>3</sup> / <sub>4</sub> " type B Phillips Pan Head (Fastens shear block to verticals)	<b>S009</b>
	#12 X <sup>3</sup> / <sub>4</sub> " Phillips Flat Head (Fastens head member to shear block & sidelite base to P1137 anchor)	<b>S149</b>
	#10 X <sup>1</sup> / <sub>2</sub> " Phillips Truss Head (Fastens horizontal and sill to shear block & P1137 anchor to vertical)	<b>S191</b>
	#8 X <sup>3</sup> / <sub>8</sub> " type A Phillips Pan Head (Fastens end dam to sill flashing)	<b>S196</b>
	#10-24 X 1" Phillips Hex Head (Frame assembly screw at screw splines)	<b>S202</b>
	Drill Guide (for screw spline and shear clip assembly)	<b>P1139</b>

**OPTIONAL TUBE MEMBERS**

SHAPE	DESCRIPTION	PART No.
	2" X 4 <sup>1</sup> / <sub>2</sub> " X <sup>1</sup> / <sub>8</sub> " Tube	<b>E1451</b>
	4 <sup>1</sup> / <sub>2</sub> " X 4 <sup>1</sup> / <sub>2</sub> " X <sup>1</sup> / <sub>8</sub> " Tube	<b>E0133</b>

## QUICK REFERENCE CHECKLIST

1. Make sure the opening is square and the caulk joints are 1/4" minimum around the frame.  
 Note: Frames that utilize the T14259 sill flashing must have a minimum of 3/8" caulk joint at head.
2. Ensure surfaces that will be sealed are free of contaminants that can lead to adhesion issues.
3. Sill flashing must be properly shimmed and level from left to right and front to back for proper drainage.
4. A continuous line of sealant must be applied between the sill and the top interior leg of the sill flashing
5. Check that all weeps and baffles (if required) conform to the locations and sizes called out in these instructions.
6. Ensure that sill flashing weep holes are not plugged by the perimeter seal.
7. A sill flashing splice is needed in openings larger than 24 feet. Follow instructions for installing and sealing.
8. End dams must be installed and sealed onto the sill flashing. Fasteners used must also be sealed.
9. Where the sill flashing abuts a door jamb, the jamb pocket cavity must be completely sealed to dam this area.
10. Cap seal any exposed anchor or screw.
11. Butter seal ends of horizontal frame members that are joined to vertical members.
12. Water diverter installation and sealing is critical. Check installation against instructions to ensure conformity.
13. Apply sealant between all corner gasket joints.
14. Glass bites must be equal on all sides.
15. Double check anchor size and location against installation instructions or approved shop drawings.
16. Insure that interior seal is married to sill flashing interior leg.

## GLASS SIZE CALCULATION

Width tolerance = + 0", - 1/16"

### Typical Framing:

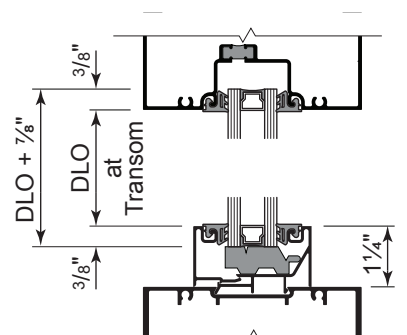
Glass Width = D.L.O. plus 3/4"

Glass Height = D.L.O. plus 3/4"

### Transoms with Sash:

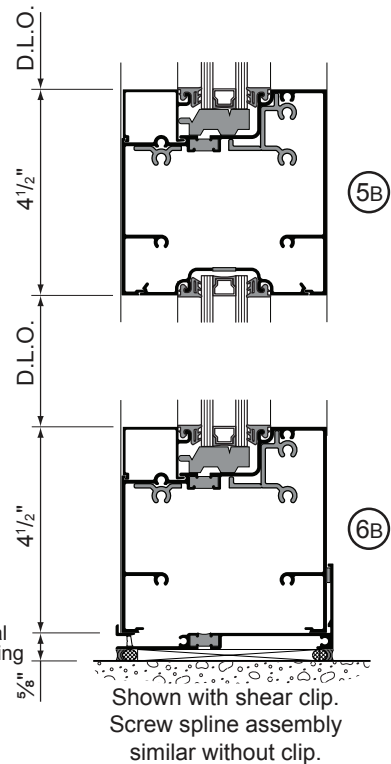
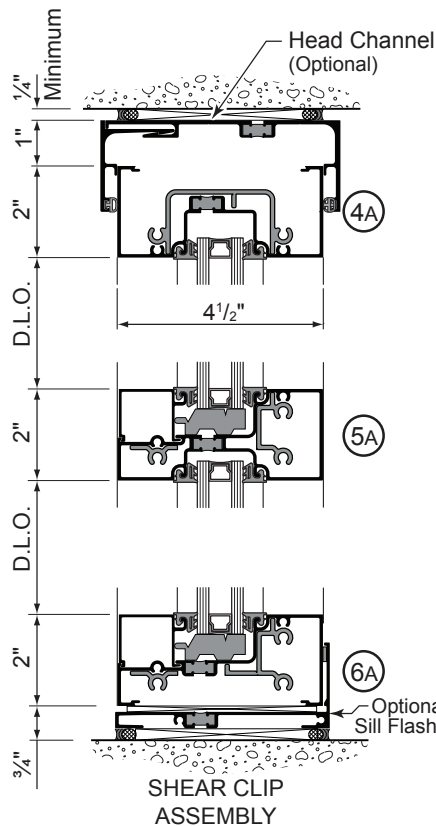
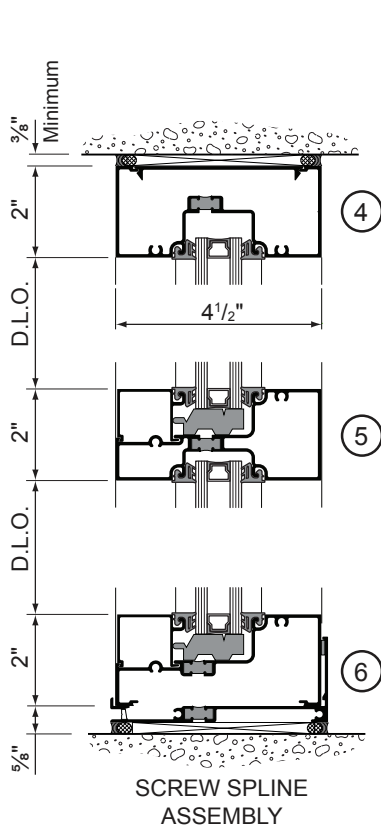
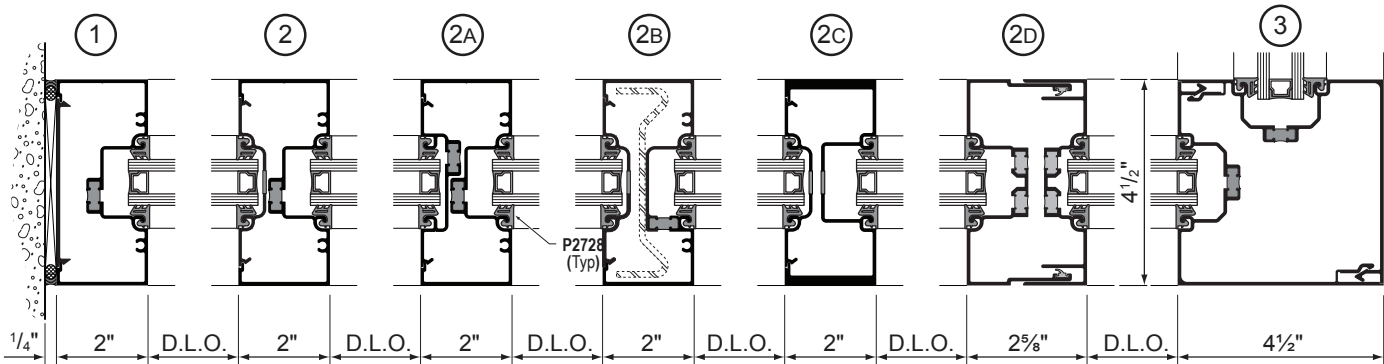
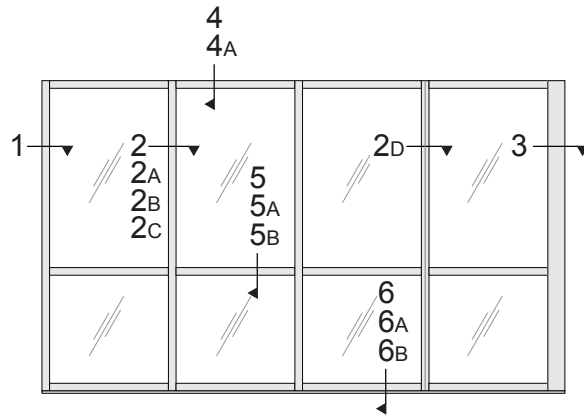
Glass Width = D.L.O. plus 3/4"

Glass Height = D.L.O. plus 3/4" (Ref. **Fig.19.1**)

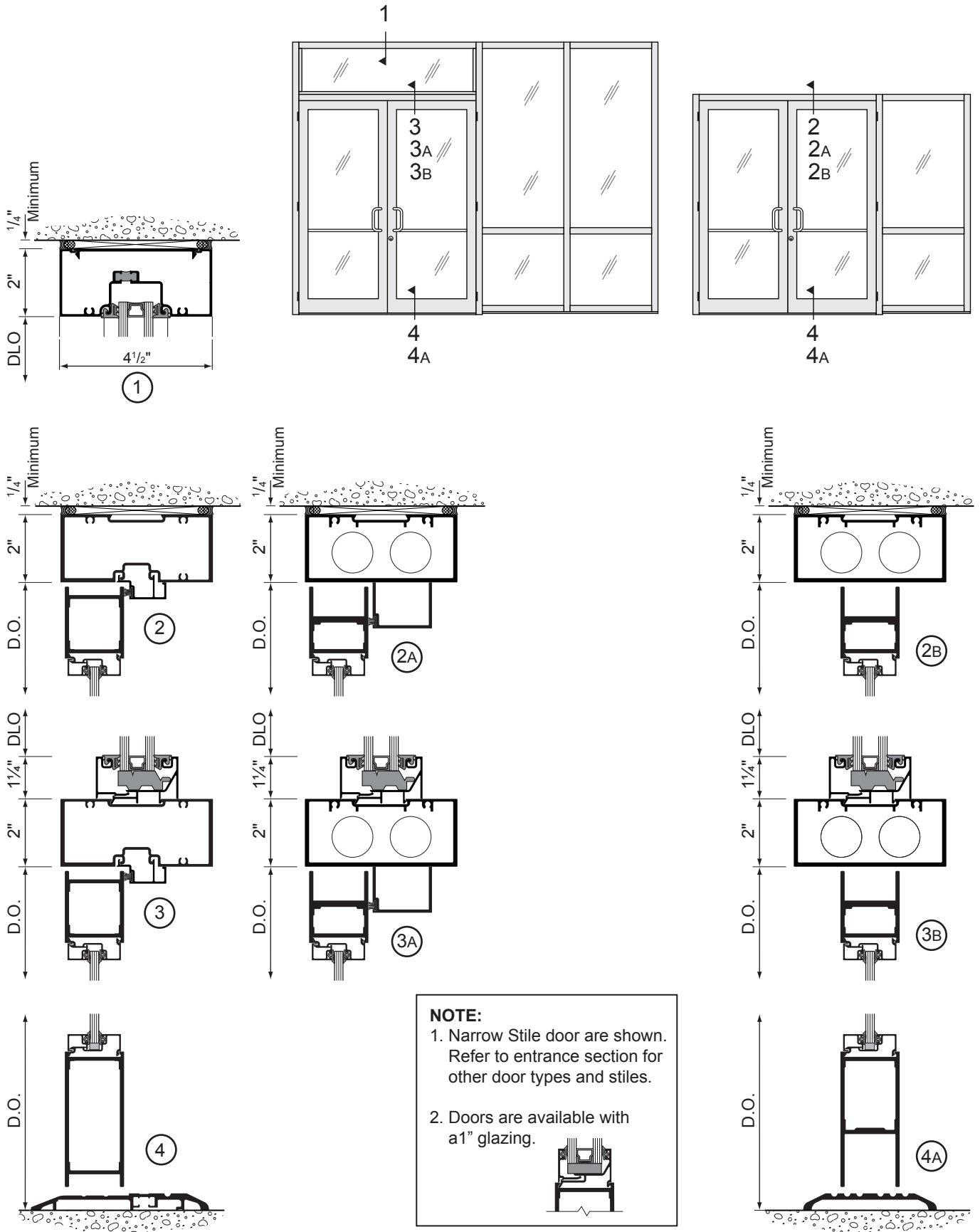


VERTICAL D.L.O. at SASH  
**Fig. 19.1**

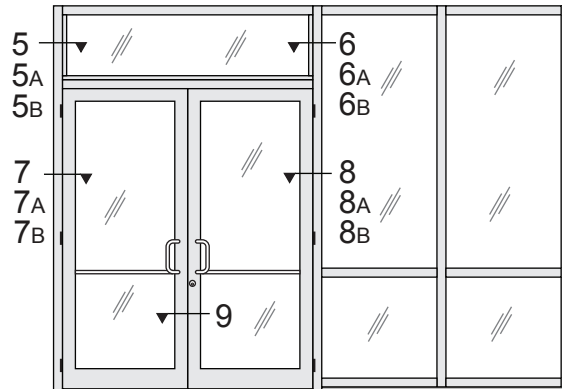
**TYPICAL ELEVATION  
with DETAILS**



## DOOR FRAME ELEVATION with HORIZONTAL DETAILS



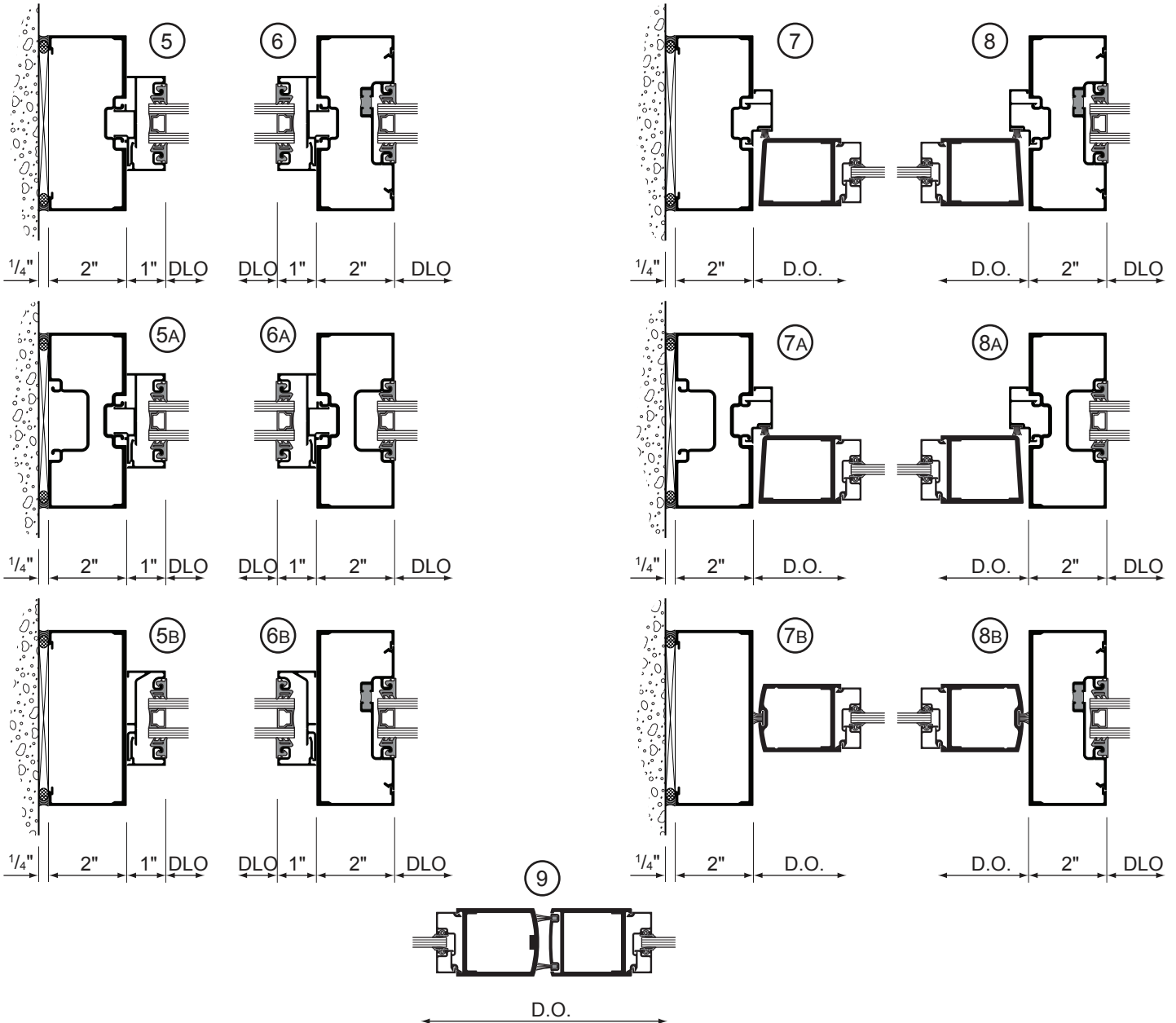
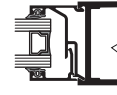
**DOOR FRAME ELEVATION  
with VERTICAL DETAILS**



**NOTE:**

1. Narrow Stile door are shown.  
Refer to entrance section for  
other door types and stiles.

2. Doors are available with  
a1" glazing.



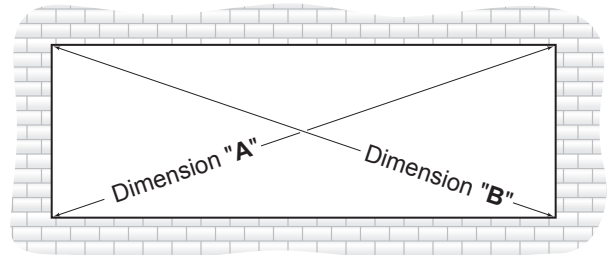
## FRAME FABRICATION

**NOTE: Non-thermal extrusions are shown in these instructions for clarity. Fabrication and installation of thermal members are the same.**

### Step 1: Determine Frame Size

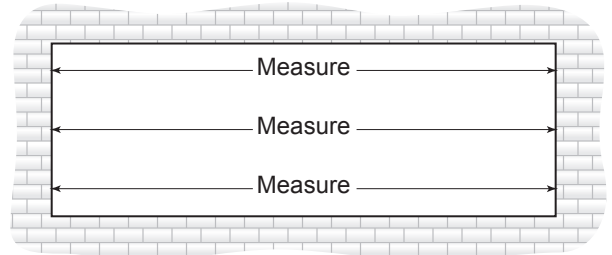
#### Frame Width

- A. Make sure the opening is square and plumb. Measure each diagonal of the opening. **SEE Fig. 23.1.**



**Fig. 23.1** Dimension "A" = "B"

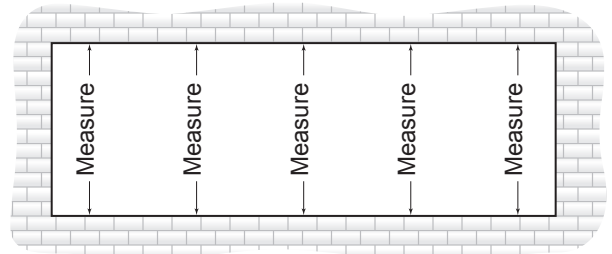
- B. Measure the width of the opening at the top, middle and bottom. Select the smallest of these dimensions and subtract the left and right caulk joint width per approved shop drawings (1/4" min caulk joint at each jamb). **SEE Fig. 23.2.**



**Fig. 23.2**

#### Frame Height

- C. Measure the height of the opening at several points along the entire width of the opening. Select the smallest of these dimensions and subtract the top and bottom caulk joint height per approved shop drawings (1/4" minimum caulk joint at sill. At head, caulk joint can be 1/4" when using T14055 or similar flashing. When using T14259 or E14059 sill flashing, head caulk joint must be 1/2"). **SEE Fig. 23.3.**



**Fig. 23.3**

### Step 2: Cut Material to Size

**Note:** Door framing material comes cut to size from the factory. In cases of door frames with transoms, the door jams must be cut down in the field to size and head member attached per standard instructions shown within this manual.

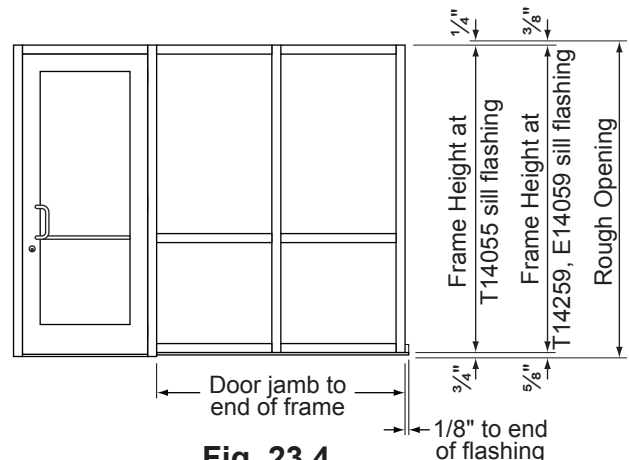
#### Framing Members

Sill Flashing with Entrance. Door Jamb to End of Frame + 1/8"	
(SEE Fig. 23.4)	
Sill Flashing without Entrance.....	Frame Width + 1/4"
Verticals .....	See Fig. 20.4
Head, Horizontal & Sill .....	D.L.O.
Horizontal & Sill Glass Stops .....	D.L.O. - 1/32"
Closure Pockets at Verticals .....	See Fig. 20.4
Glazing Adaptors.....	D.L.O. - 1/32"
Snap-In Fillers.....	Refer to Approved Shop Drawings

#### Accessories

Exterior Gasket .....	D.L.O. + Allowance*
Interior Gasket .....	D.L.O. + Allowance*

\*Allowance = 1/8" extra length per foot of D.L.O.



**Fig. 23.4**

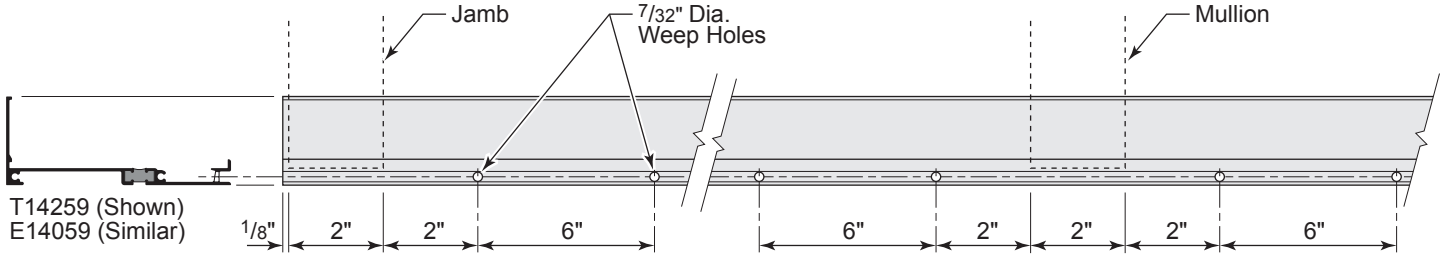
#### Sill Flashing Note:

For openings wider than 24', the sill flashing must be spliced at the center line of a D.L.O. every twelve to fifteen feet. Splice joint should be 3/8" wide. **SEE Step 13, Page 39 & 40** for sill flashing splice details.

**FRAME FABRICATION**

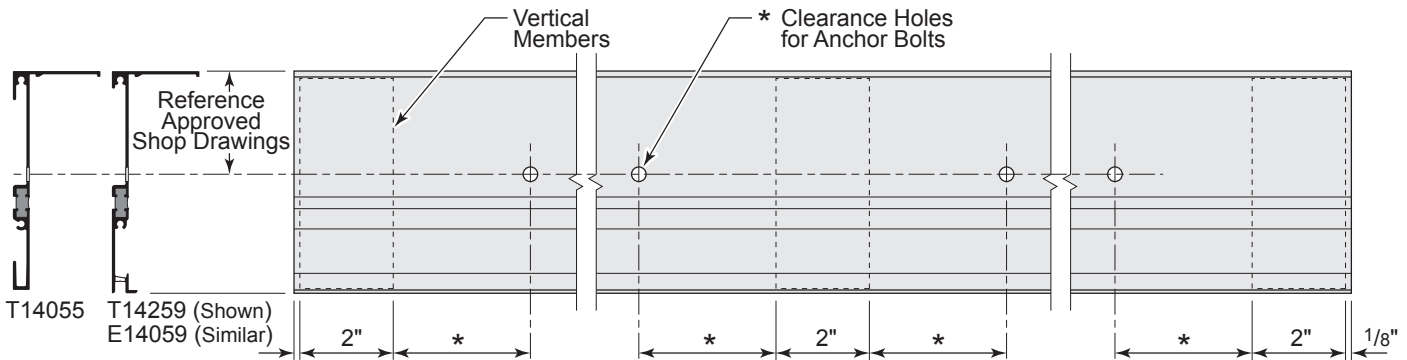
**Step 3: Fabricate Sill Flashing**

A. When using T14259 or E14059, drill two 7/32" dia. weep holes at 2" and 6" from each side of the verticals.



**Fig. 24.1**

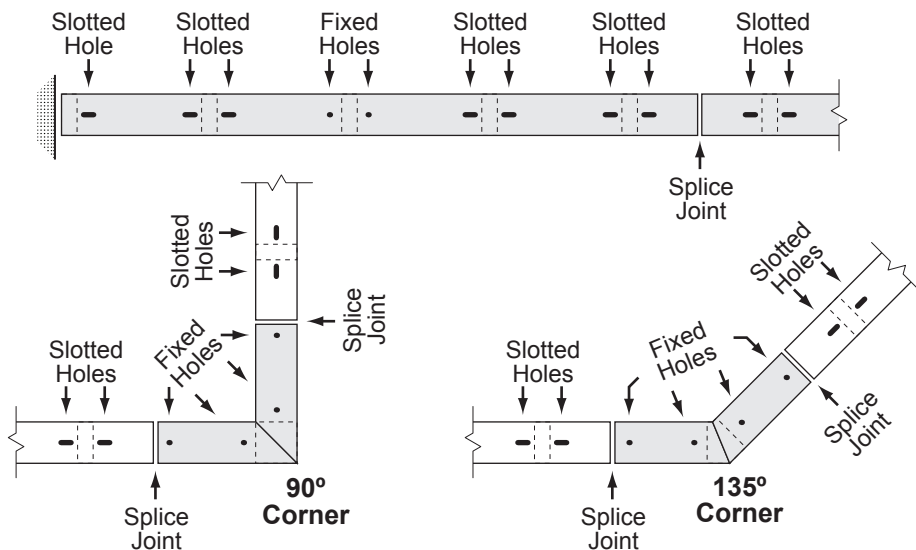
B. Drill clearance holes for perimeter anchors. Size and quantity vary per job. Refer to approved shop drawings.



**NOTE:**  
 DLO's larger than 42" require an additional anchor hole at mid-point of bay.

\* Reference approved shop drawings for anchor hole sizes, locations and quantity.

**Fig. 24.2**



**Typical Sill Flashing Anchor Hole Patterns (Head channel similar)**  
 (Refer to approved shop drawings for project requirements)

**Fig. 24.3**



## FRAME FABRICATION

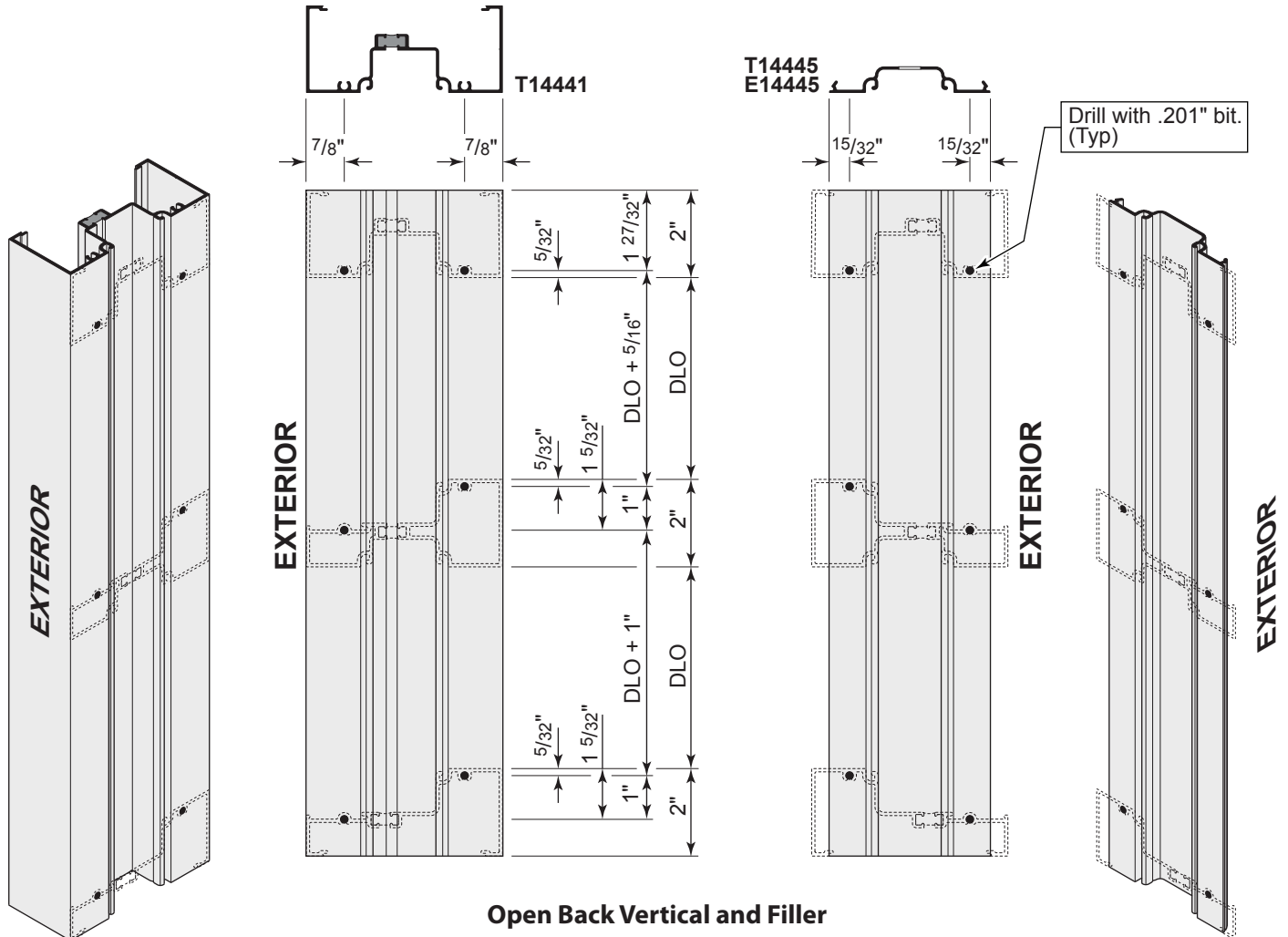
### Step 4: Fabricate Verticals & Closure Pockets for Horizontals

A. Drill frame assembly holes in verticals, jambs & closure pockets with drill fixture P1139.

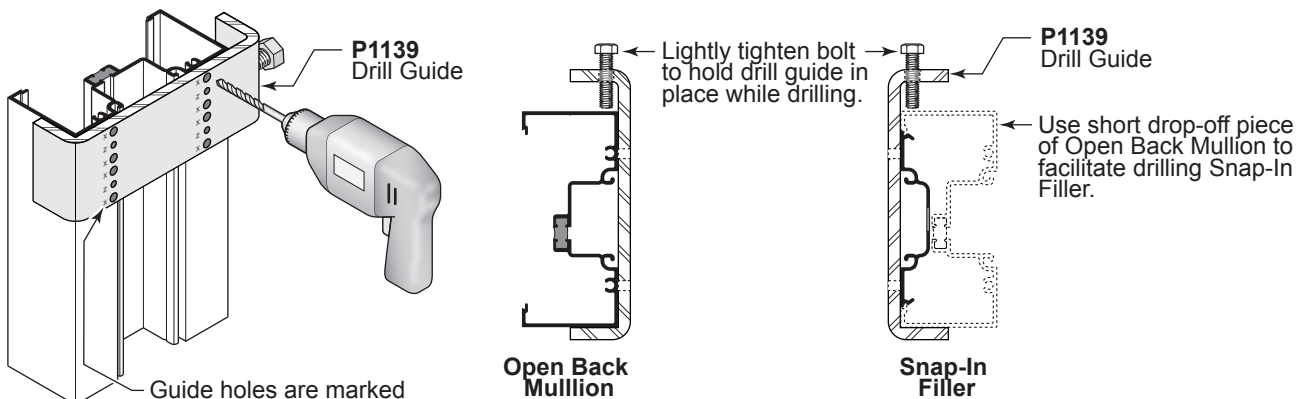
SEE Fig. 25.1 & Fig. 21.1.

a. For screw spline assembly, use holes marked 'X' in P1139. SEE Fig. 25.2

b. For shear block assembly, use holes marked 'Z' in P1139. SEE Fig. 25.2

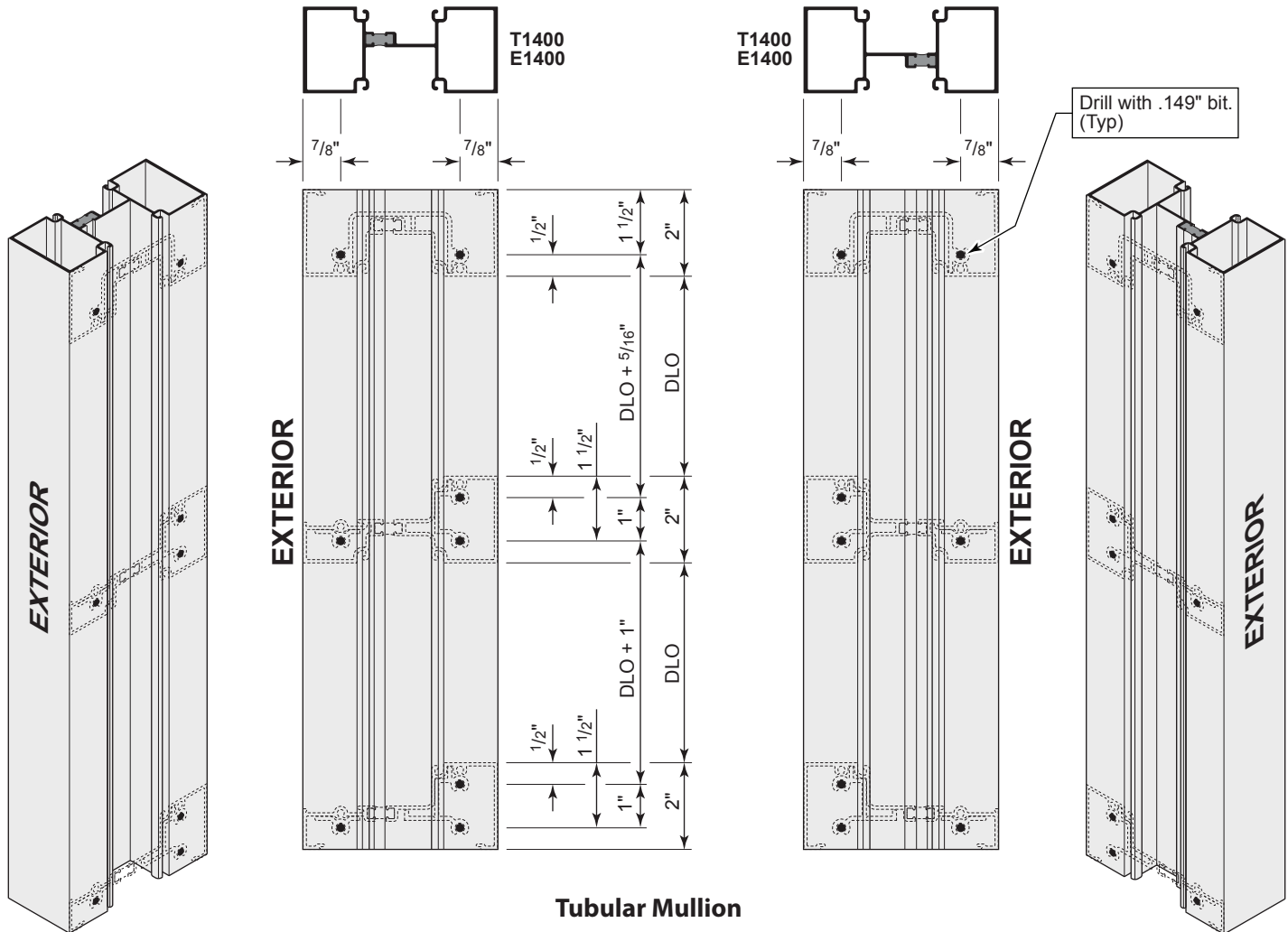


**Fig. 25.1**



**Fig. 25.2**

**FRAME FABRICATION**

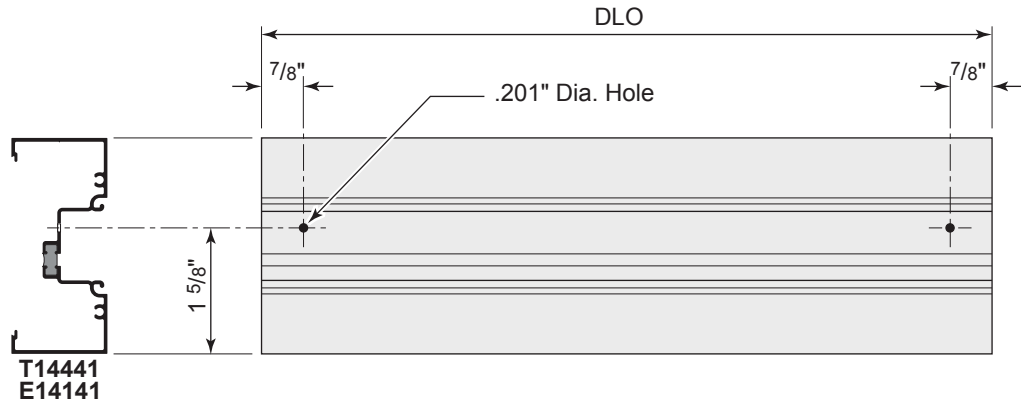


**Tubular Mullion**  
**Fig. 26.1**

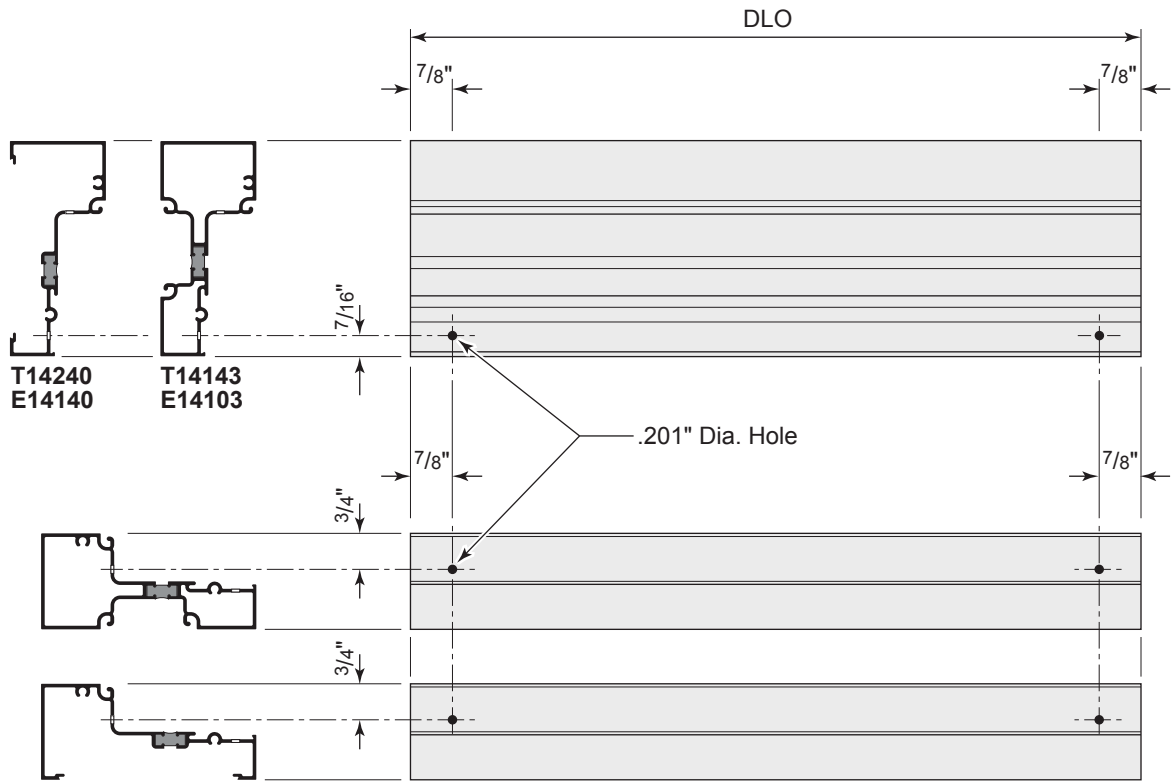
**FRAME FABRICATION**

**Step 5: Fabricate Horizontal Members for Shear Blocks**

- A. For shear block assembly, drill .201" dia holes in the head, horizontal and sill members as shown in **Fig. 27.1** & **Fig. 27.2**



**Fig. 27.1**

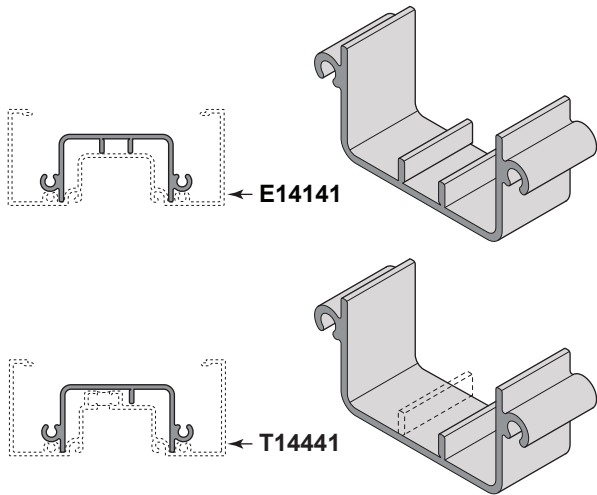


**Fig. 27.2**

## FRAME FABRICATION

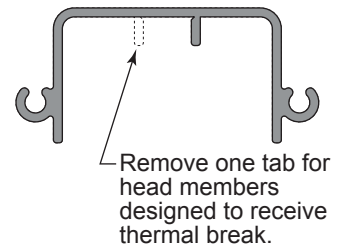
### Step 6: Fabricate Shear Blocks (As Required)

- A. For shear block assembly, P1134 shear block must be modified.
- B. **SEE Fig. 28.1 & Fig. 28.2** for instructions on modifying for the various horizontal sections.

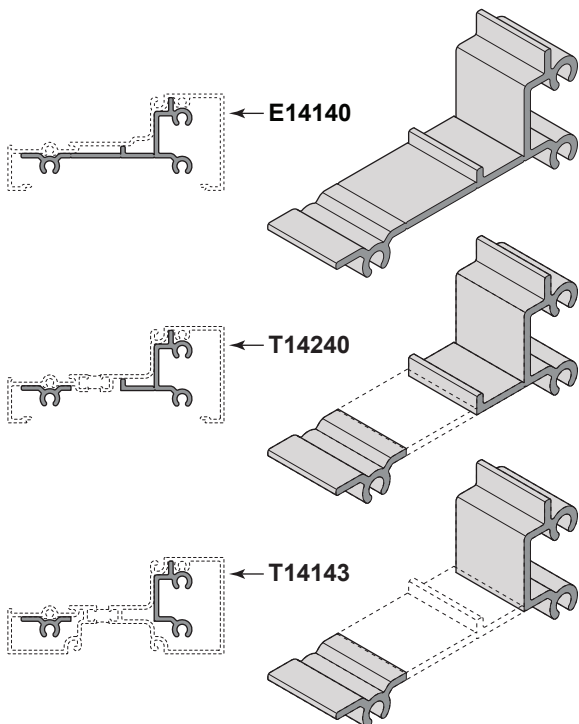


**P1133 (Un-modified)**  
 Used at non-thermal open back head members.

**P1133 (Modified)**  
 Used at thermal open back head members



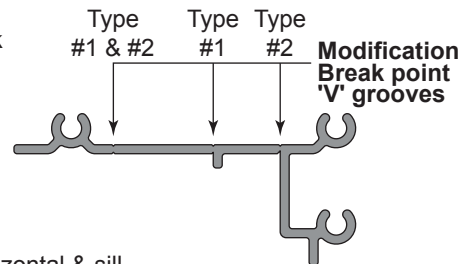
**Fig. 28.1**



**P1134 (Un-modified)**  
 Used at non-thermal open back horizontal & sill members.

**P1134 (Modification type #1)**  
 Used at thermal open back horizontal & sill and at 4½" x 4½" sidelite base.

**P1134 (Modification type #2)**  
 Used at tubular horizontal and sill members.



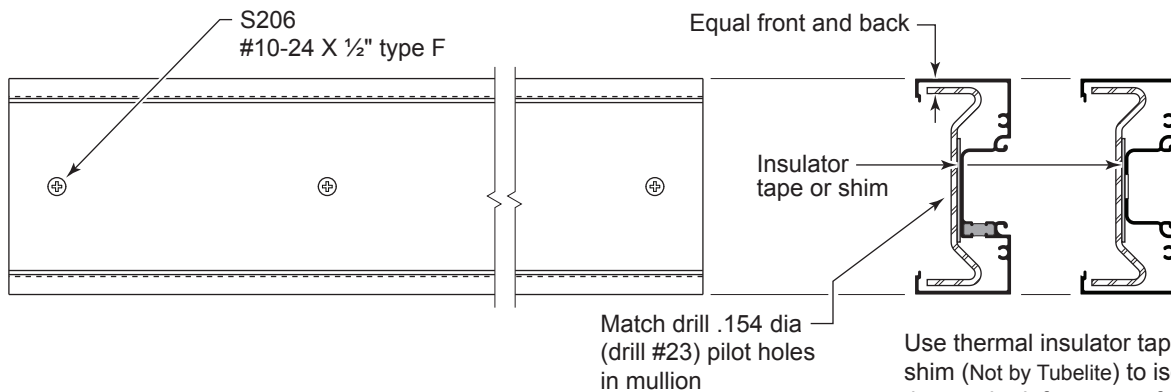
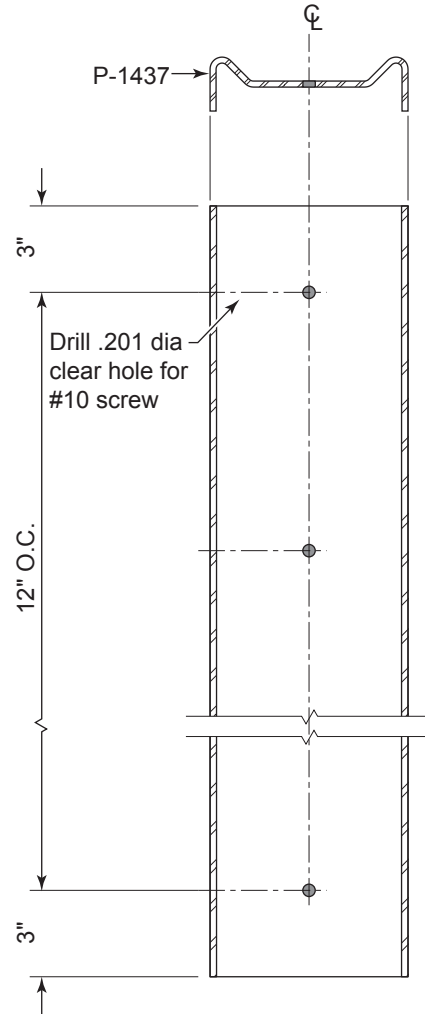
**Fig. 28.2**

## FRAME FABRICATION

### Step 7: Steel Stiffener (As Required)

- A. If P1437 steel stiffeners are required (refer to approved shop drawings), cut 4" shorter than the vertical mullion length. Paint ends to prevent rust.
- B. Use thermal insulator tape or shim (not by Tubelite) to isolate the steel reinforcement from the vertical members (thermal applications only).
- C. Drill and countersink clear hole in vertical and tap hole in P1437 steel stiffener for attachment screw. Size and spacing of screw per approved shop drawings.

**NOTE:**  
Use of #10 screw at spacing shown as a general guide. Refer to approved shop drawings or engineer's calculations for specific application.



**Fig. 29.1**

Use thermal insulator tape or shim (Not by Tubelite) to isolate the steel reinforcement from the vertical members.

**NOTE:** E14445 & T14445 must be used when applying P1437 steel reinforcement.

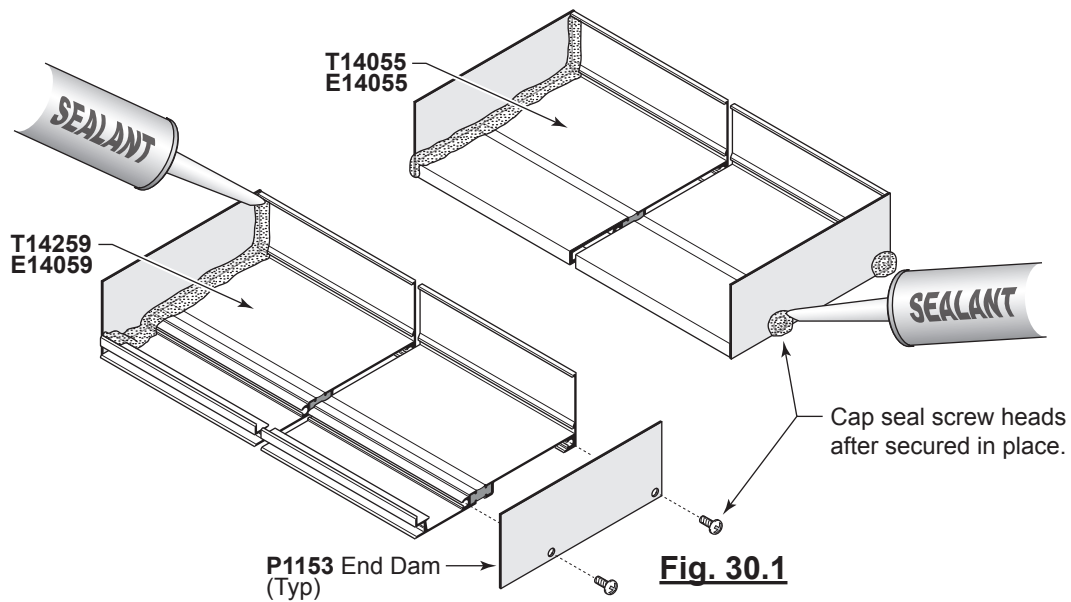
## FRAME ASSEMBLY

### Step 8: Install Sill Flashing End Dams

- A. Install P1153 end dam at each end of sill flashing with (2) S196 #8 x  $\frac{3}{8}$ " PH screws. Set aside and allow sealant to cure.

**NOTE:**

If sill flashing is spliced, install end dams on jamb-end only. Refer to **Step 13, page 39** for splicing instructions.

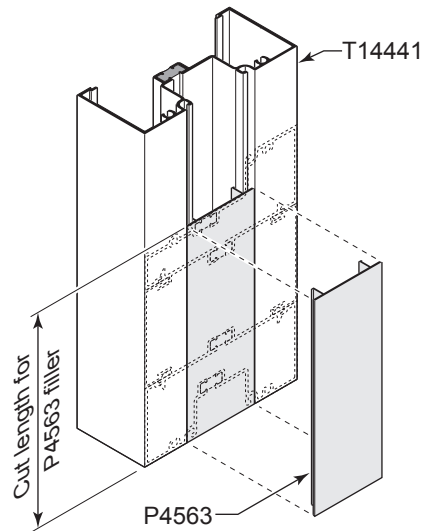


## FRAME ASSEMBLY

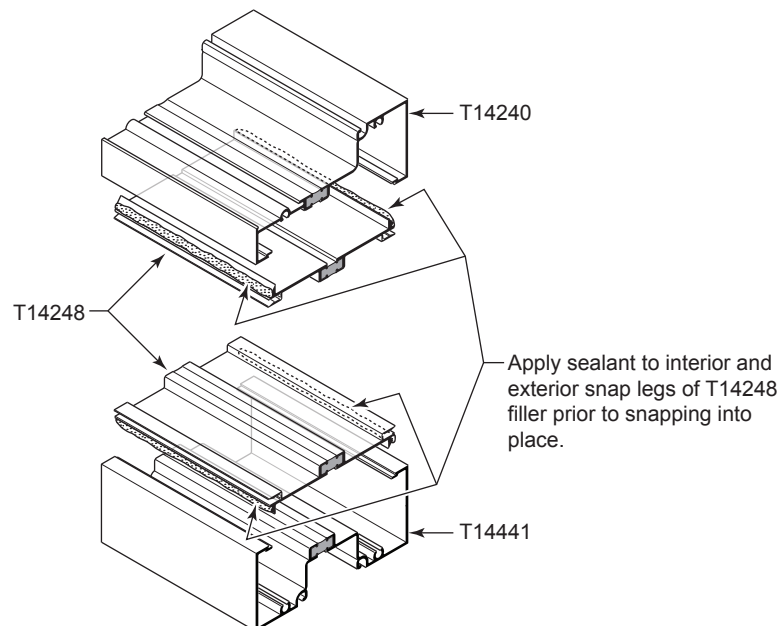
### Step 9: Optional High Sidelite Bases

Prior to assembling frames, follow these steps if using high sidelite base members.

- A. Pre-attach P4563 pocket filler into the pocket of the vertical mullion and closure pocket members. Cut length of the filler can be determined by measuring from the bottom of the vertical mullion/closure pocket to the underside of the water diverter at the high sidelite base. **SEE Fig. 31.1**
- B. Attach snap-in adaptor T14248 to the T14441 horizontal (lower member of the sidelite base). **SEE Fig. 31.2**
- C. Seal joints between the adaptor and horizontal.
- D. Attach snap-in adaptor T14248 to the T14240 open back sill (upper member of the sidelite base). **SEE Fig. 31.2.**



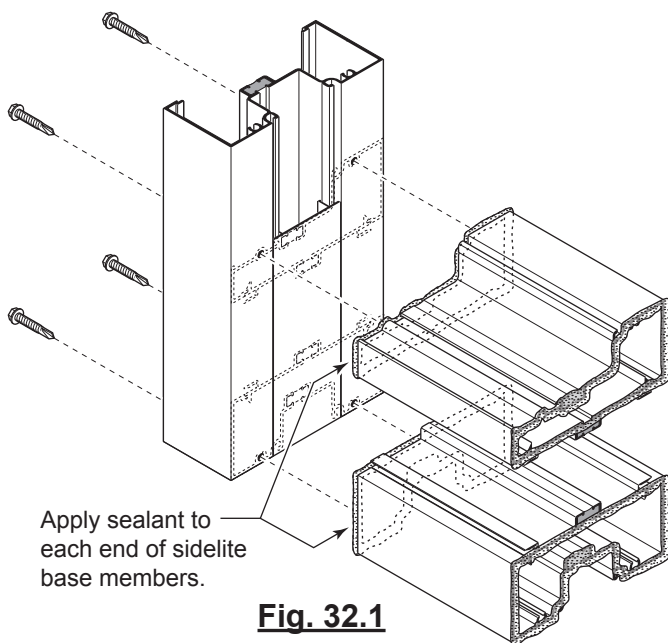
**Fig. 31.1**



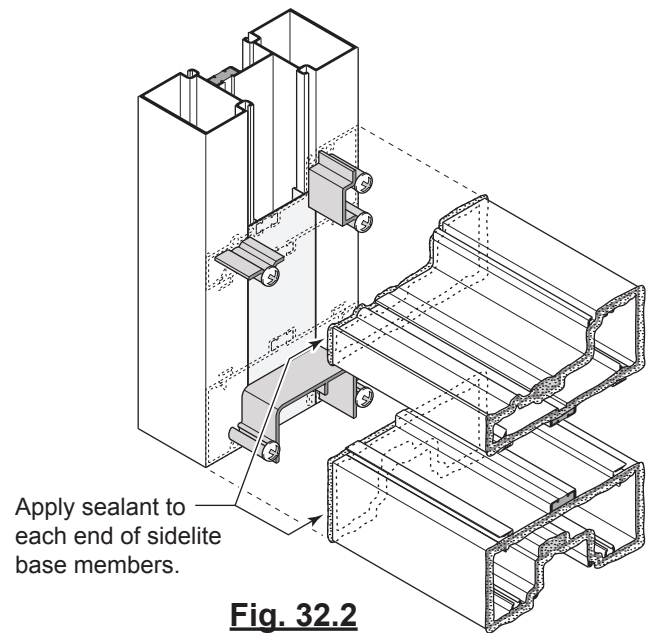
**Fig. 31.2**

## Step 9: Optional High Sidelite Bases (Continued)

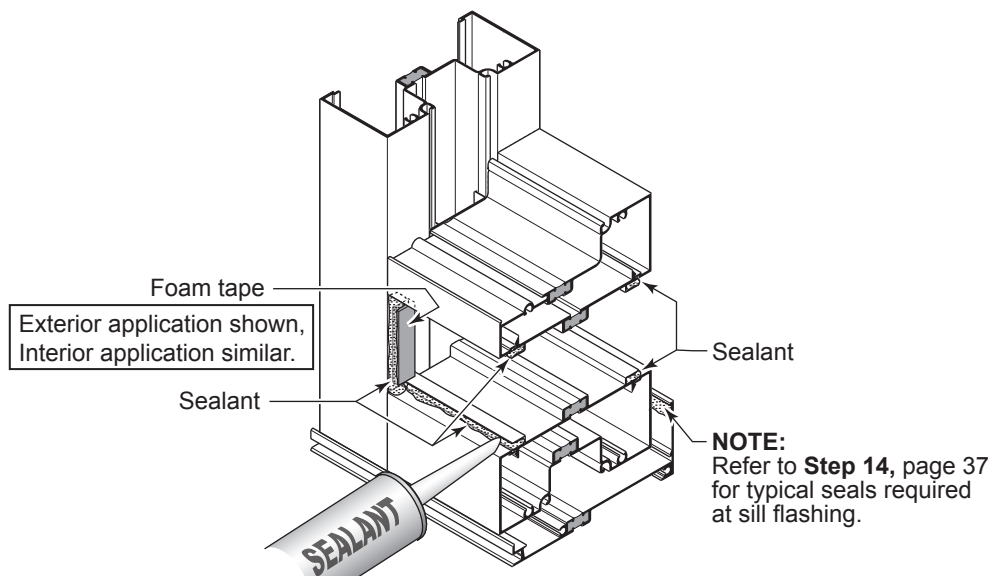
- E. Seal ends of the upper and lower members where it will contact the vertical mullion and closure pocket. **SEE Fig. 32.1 & Fig. 32.2.**
- F. Before attaching the upper and lower members to the vertical, determine the height of the snap cover to be used. Attach the lower and upper members of the sidelite base to the vertical and closure pocket.
- G. *Optional:* Place one-sided closed cell adhesive tape along the edges of the vertical where the sidelite base covers will be installed. Place a bead of sealant onto the tape. **SEE Fig. 32.3.**
- H. Place a bead of sealant into the receptor areas of the snap-in adaptor. **SEE Fig. 32.3.**



**Fig. 32.1**  
**SPLINE ASSEMBLY**



**Fig. 32.2**  
**CLIP ASSEMBLY**

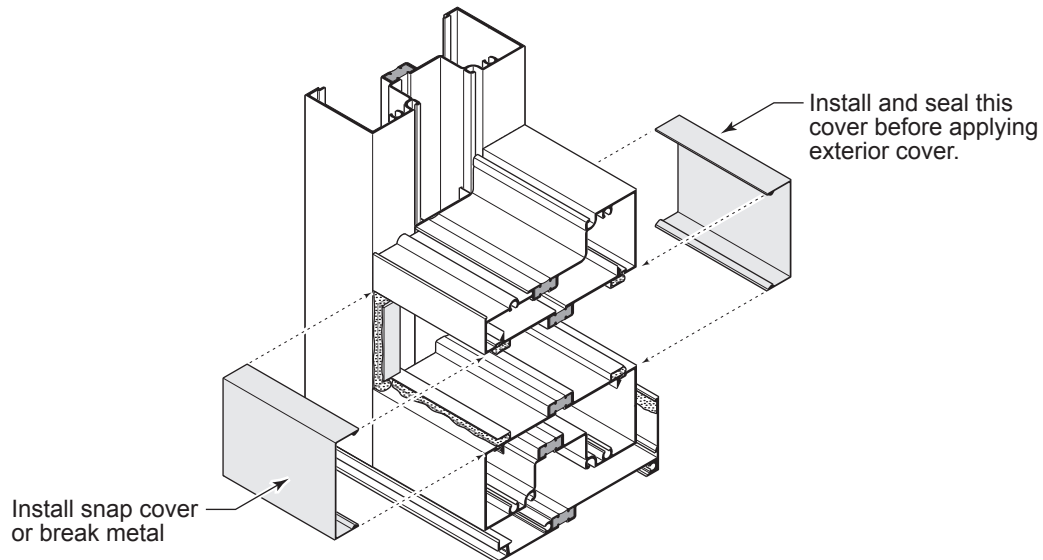


**Fig. 32.3**

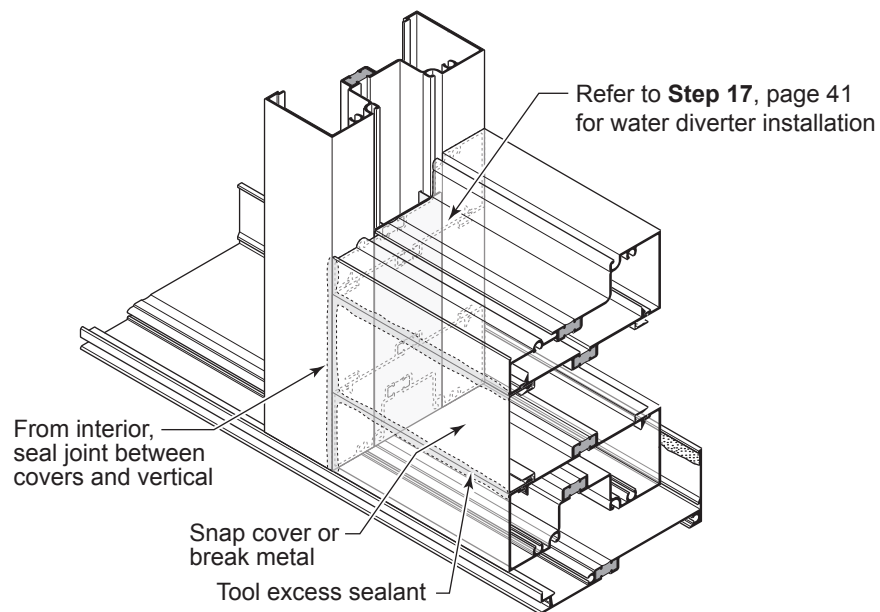


## Step 9: Optional High Sidelite Bases (Continued)

- I. Attach a snap cover or brake metal to the inside surface of the sidelite base. **SEE Fig. 33.1.**
- J. From the exterior, seal joints between the snap cover and vertical members. **SEE Fig. 33.2.**
- K. Attach a snap cover or brake metal to the exterior. **SEE Fig. 33.1.**



**Fig. 33.1**



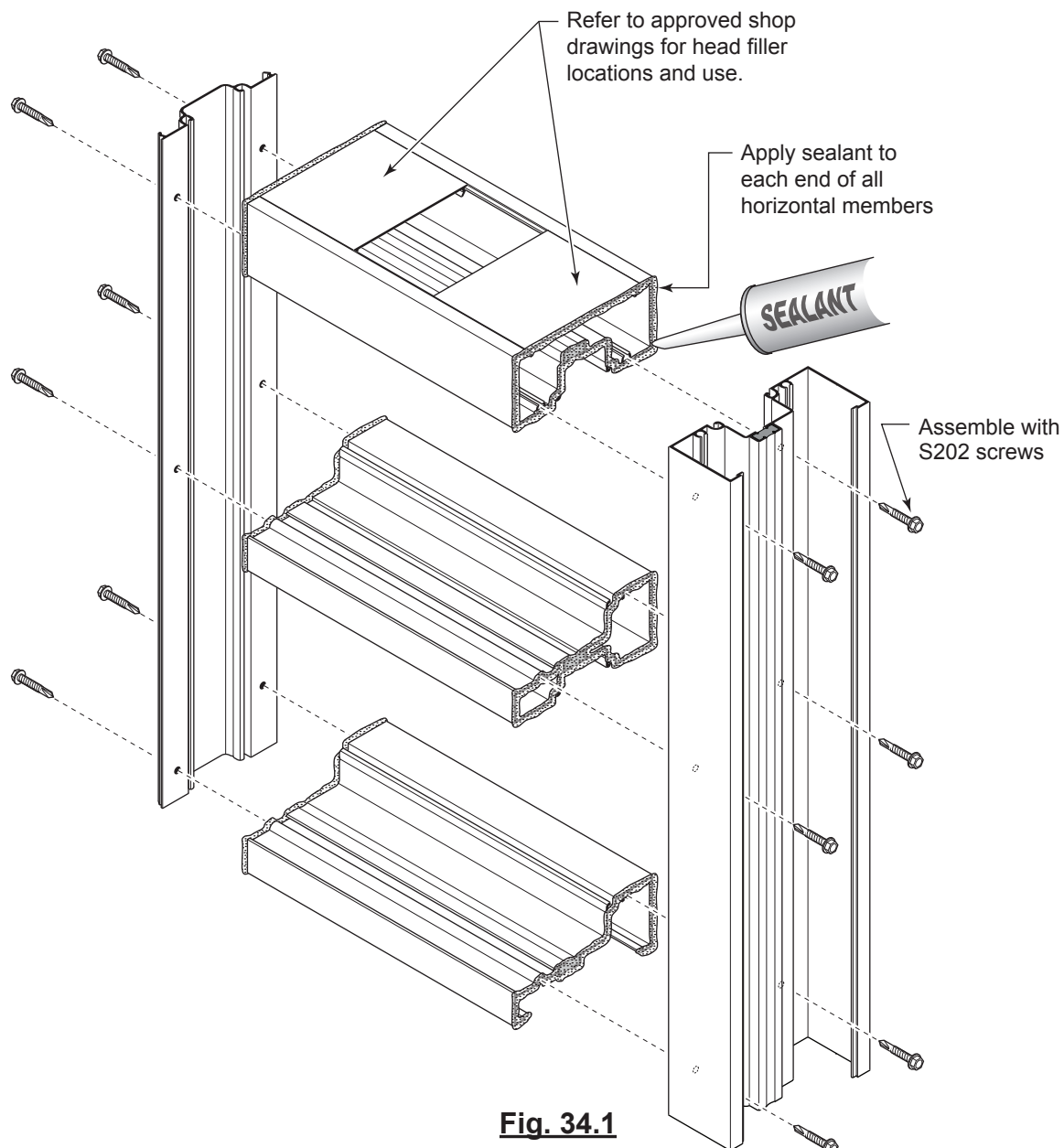
**Fig. 33.2**

## FRAME ASSEMBLY

### Step 10: Assemble Frames

#### Screw Spline Assembly

- Clean all mating surfaces on horizontal & vertical.
- Apply sealant to ends of the head, horizontal and sill members prior to attaching to the vertical members. **SEE Fig. 34.1.**
- Attach head, horizontal and sill members to the vertical and closure pocket members with S202 #10-24 x 1" HH frame assembly screw.
- Tool sealant at each joint.

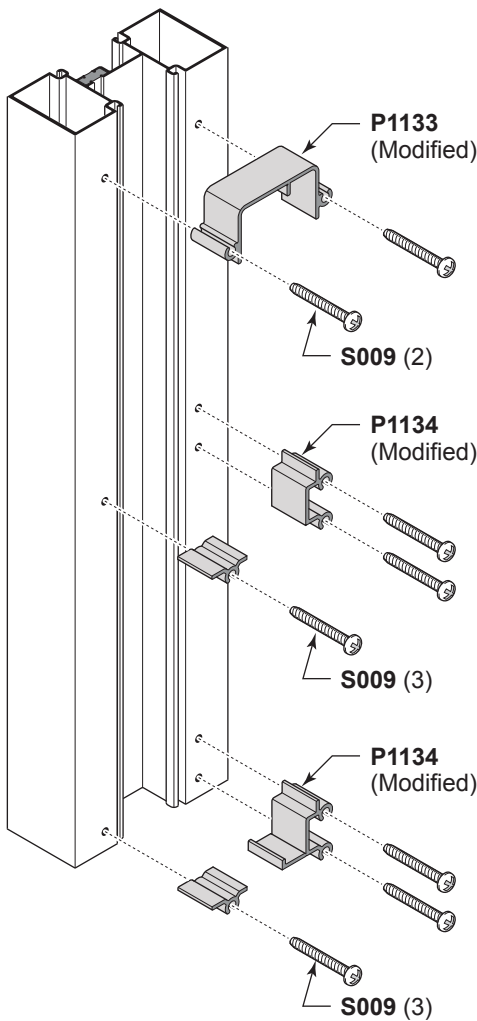


## FRAME FABRICATION

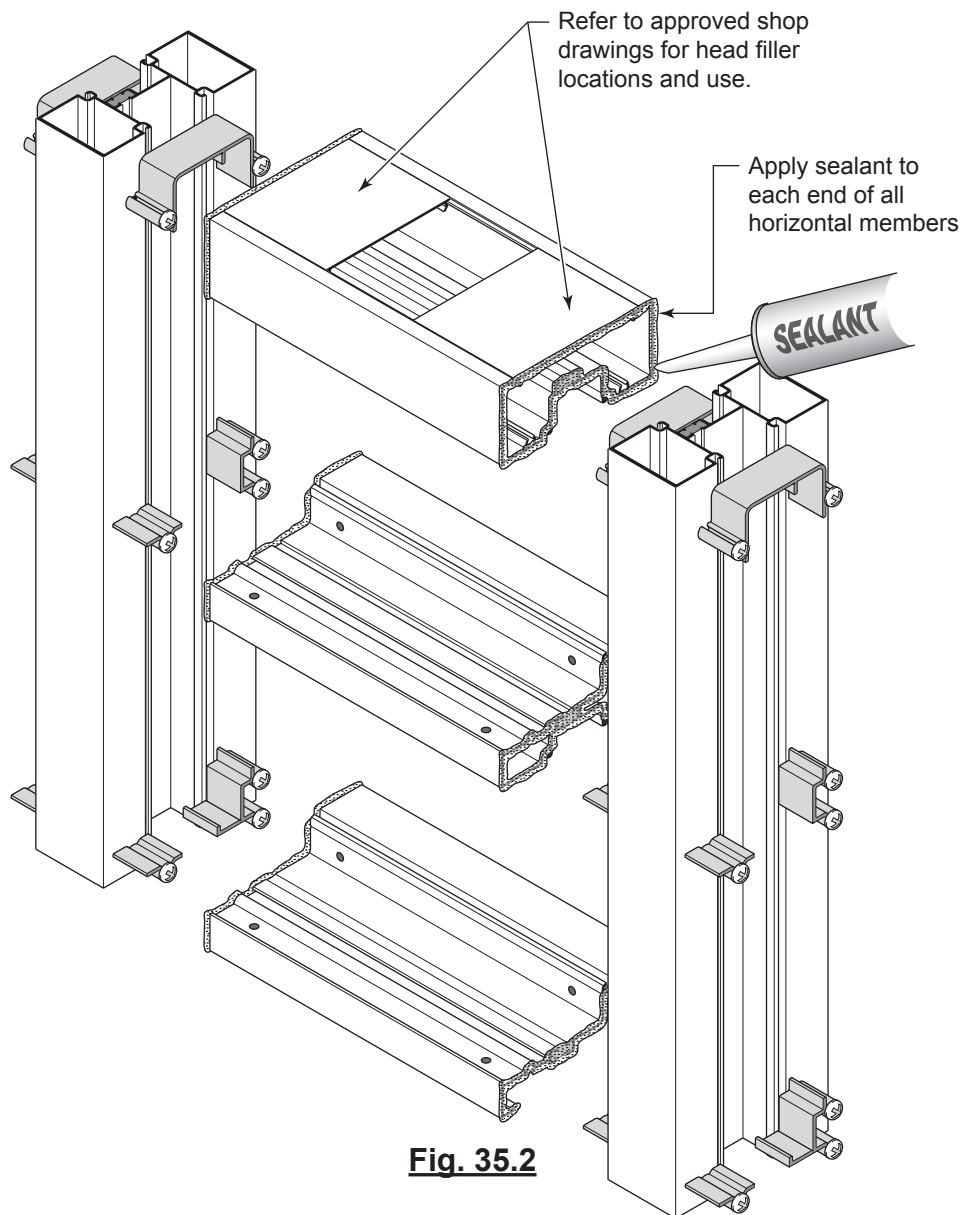
### Step 10: Assemble Frames (Continued)

#### Shear Block Assembly

- A. Install shear blocks onto vertical and closure pocket members with S009 #10 x 1 3/4" PH screw as shown in **Fig. 35.1**.
- B. Clean all mating surfaces on horizontal, vertical and shear block.
- C. Apply sealant to ends of the head, horizontal and sill members and to perimeter of shear blocks prior to attaching the horizontal members to the vertical members. See **Fig. 35.2**.
- D. Install head, horizontal and sill members over the shear blocks.
- E. Match drill tap hole in head shear block with drill #14 (.182 dia) for #12 screw.
- F. Match drill tap hole in horizontal and sill shear blocks with drill #23 (.154 dia) for #10 screw.



**Fig. 35.1**



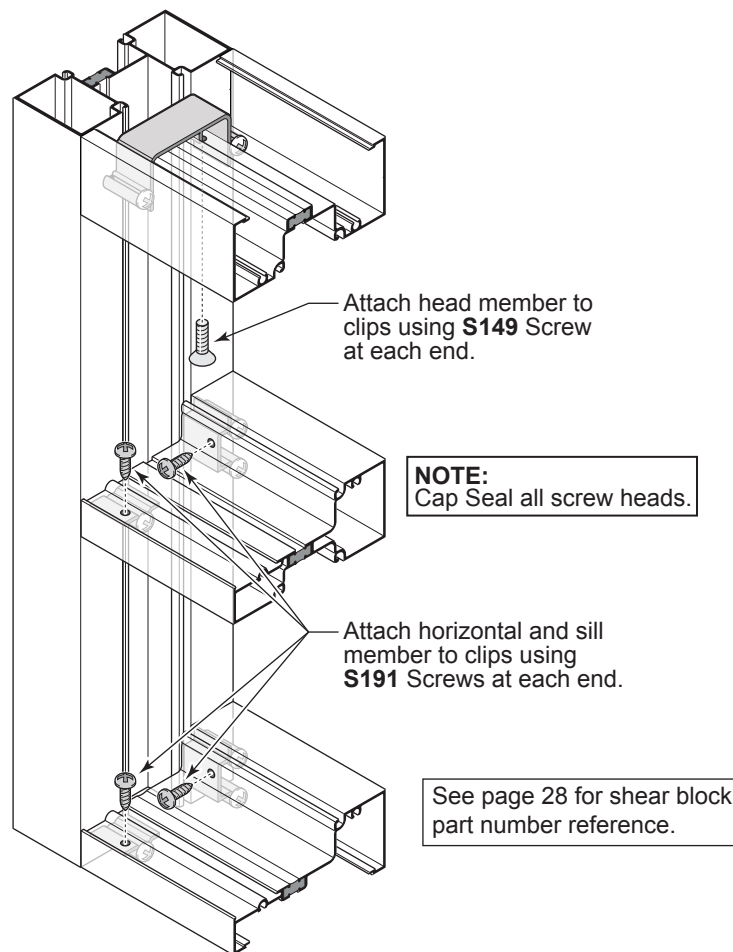
**Fig. 35.2**

## FRAME ASSEMBLY

### Step 10: Assemble Frames (Continued)

#### Shear Block Assembly (Continued)

- G. Secure head member to shear block with (1) S149 #12 x 3/4" FH screw. Secure horizontal and sill members with (2) S191 #10 x 1/2" truss head screw. See **Fig. 36.1**.
- H. Cap seal heads of screws at horizontal and sill members.



**Fig. 36.1**

## FRAME FABRICATION

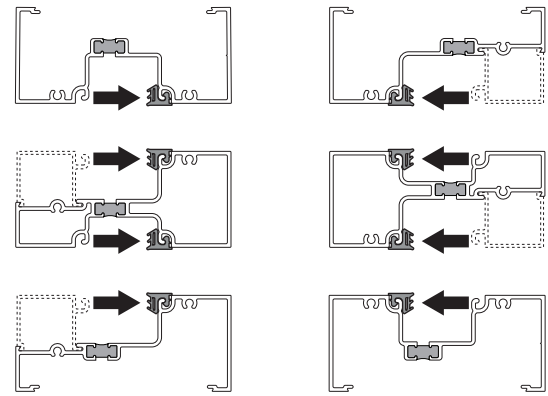
### Step 11: Install Gaskets

- A. Install glazing gasket on one side of the framing member, depending upon direction of glazing.
  - a. For inside glazing, install gaskets on exterior side of framing first.
  - b. For outside glazing, install gaskets on interior side of framing first.

**DO NOT STRETCH GASKETS WHEN INSTALLING.**  
Start at the center of D.L.O. and work towards the ends.

**NOTE:**

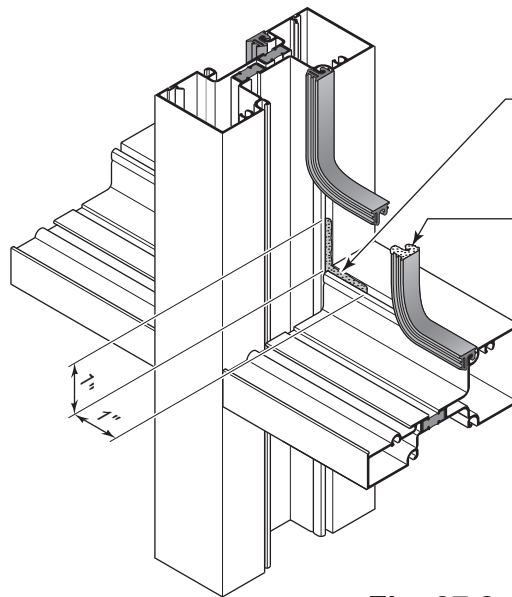
Allowance = 1/8" extra length per foot of D.L.O.



OUTSIDE GLAZE

INSIDE GLAZE

**Fig. 37.1**



Apply sealant to corners as shown. This seal is typical at all corners at interior and exterior gaskets.

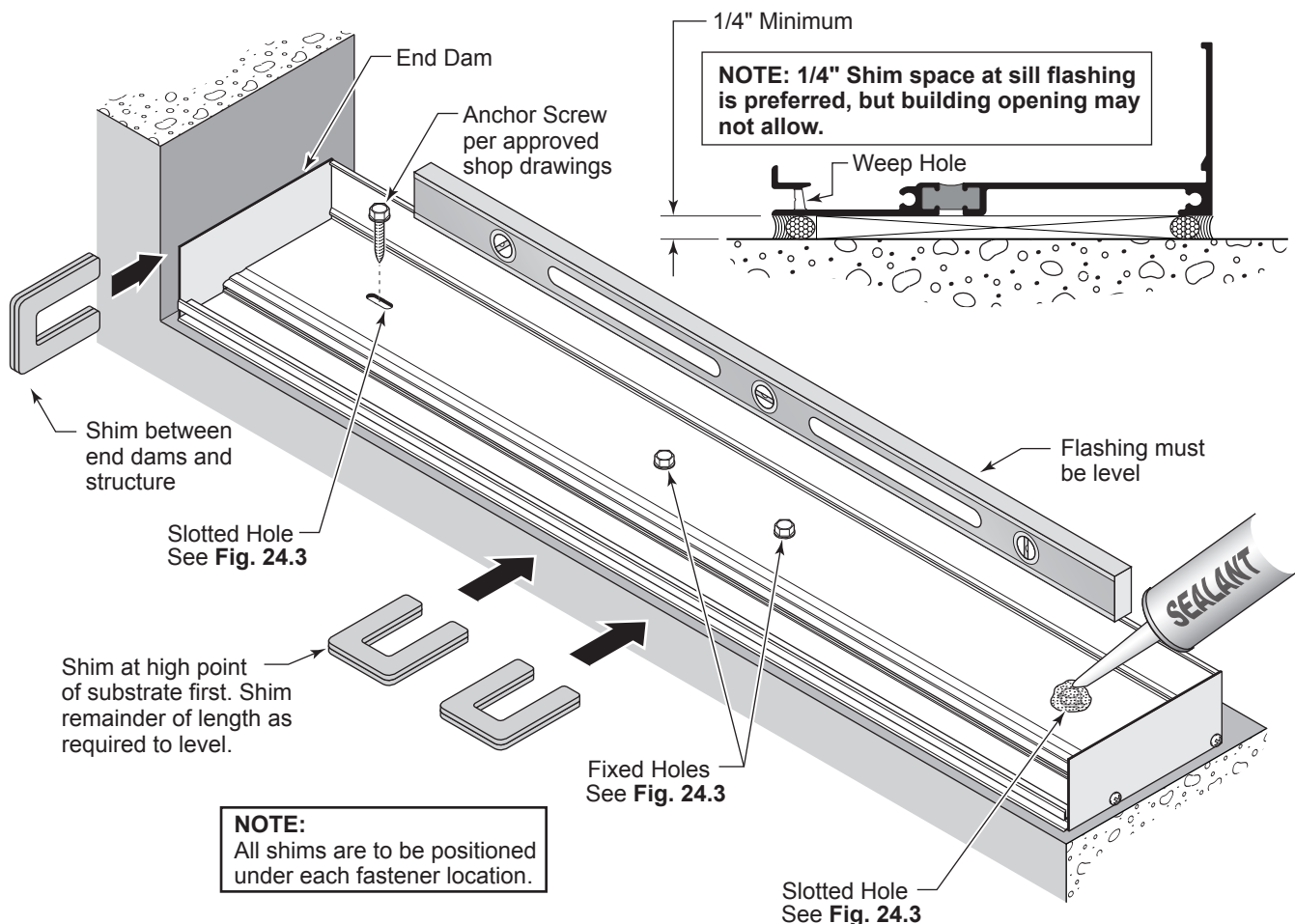
Add sealant to ends of horizontal gaskets to seal intersection with vertical gaskets at interior and exterior gaskets.

**Fig. 37.2**

## FRAME INSTALLATION

### Step 12: Install Sill Flashing (If required)

- Center the sill flashing in the opening. If sill flashing is spliced, be sure the joint at the jamb is per approved shop drawings (jamb caulk joint minus 1/8"). **If there is an entrance door in the opening, leave a gap in the sill flashing for the door frame to be installed and refer to Step 15, page 43 for sealing instructions.** Splice joint to be 3/8" minimum.
- At the highest point of the sill (smallest rough opening height), shim the sill flashing with a minimum 1/4" shim space. Sill flashing must be installed level side to side and front to back.
- Shim tight between the sill flashing end dam and building condition to ensure end dam is not dislodged during frame installation. Remove shim after frames are set in place.
- Anchor sill flashing to building substrate per approved shop drawings. Cap seal anchors after installation. Where the sill flashing abuts a door jamb, the sill flashing anchor must be located within 6" of the door jamb.



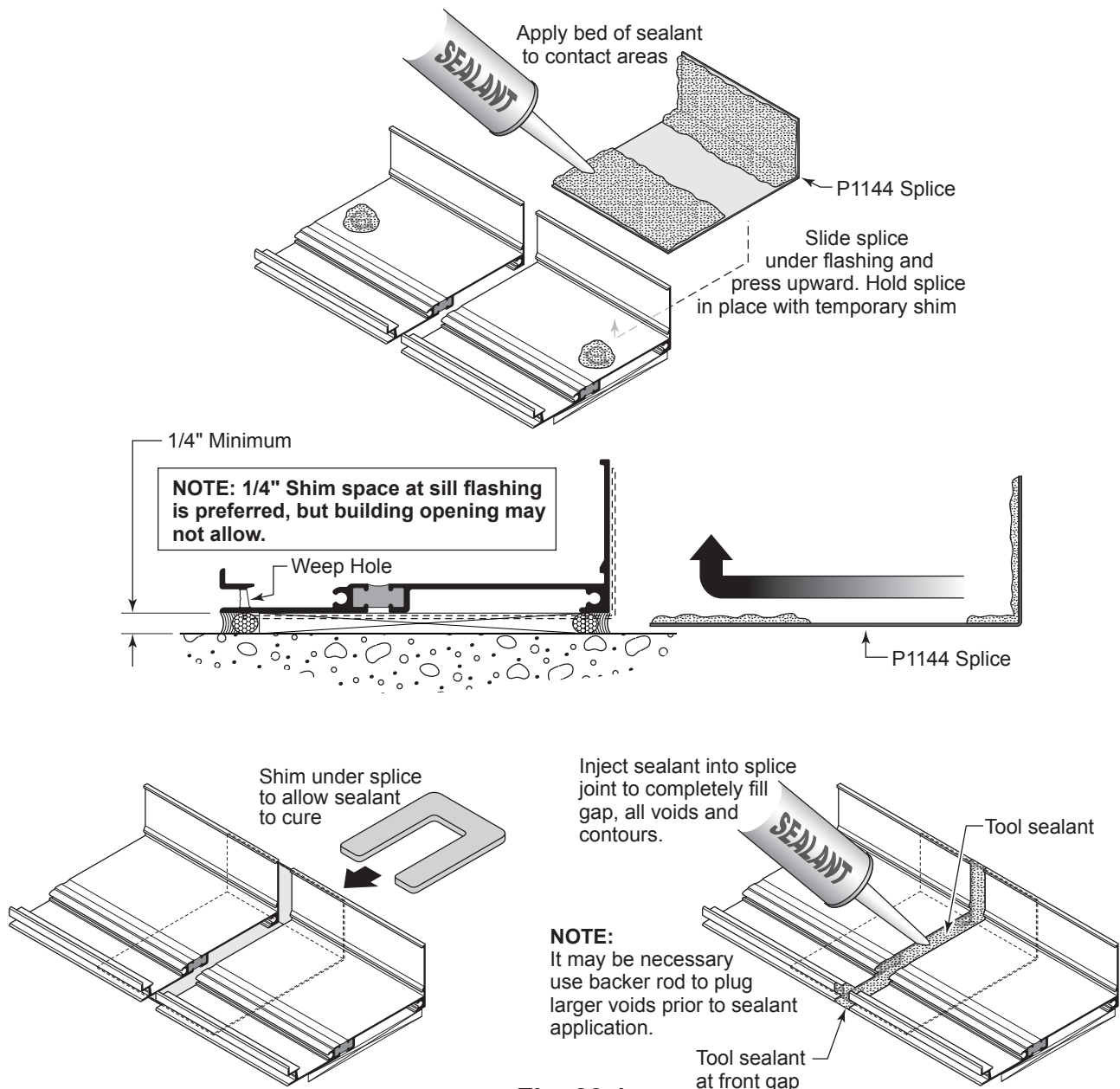
**Fig. 38.1**

## FRAME INSTALLATION

### Step 13: Sill Flashing Splice

#### Standard Aluminum Splice - Fig. 39.1

- A. Continue installing sill flashing per Step 12 across the opening.
- B. Set P1144 splice sleeve in a bed of sealant under the sill flashing at the splice location as shown in Fig. 39.1.
- C. Maintain 3/8" minimum splice joint gap at the sill flashing prior to anchoring.
- D. Apply sealant at the sill flashing splice joint.
- E. Do not locate a splice directly below a vertical mullion. Center line of D.L.O. is preferred.



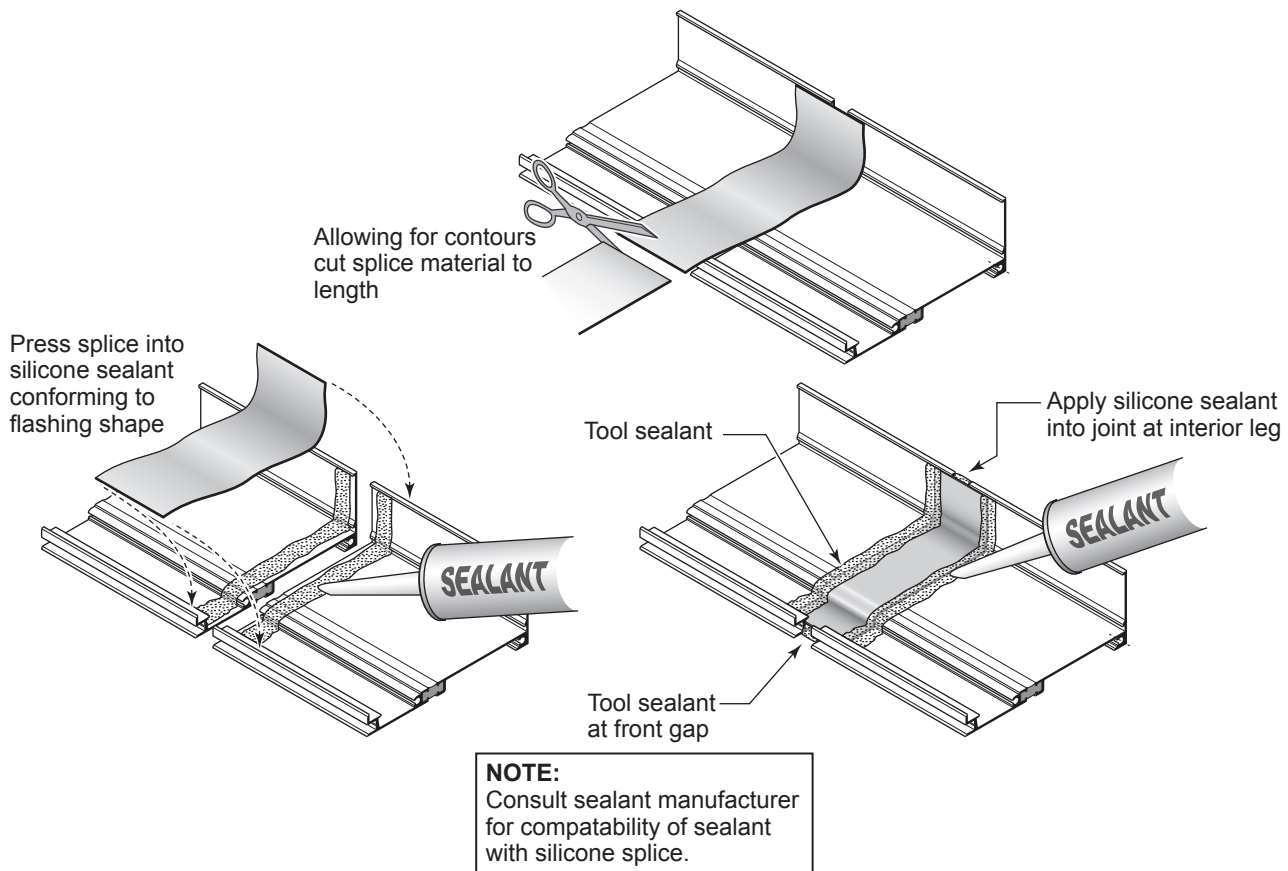
**Fig. 39.1**



## Step 13: Sill Flashing Splice (Continued)

### Optional Silicone Splice - Fig. 40.1

- A. Continue installing sill flashing per Step 12 across the opening.
- B. Lay P3444 silicone sheet into sill flashing at splice location (center of D.L.O.) and cut to length.
- C. Install backer rod under the sill flashing at the splice joint.
- D. Clean surfaces where splice will be applied. Apply sealant as shown in Fig. 40.1.
- E. Set silicone splice sleeve in place and tool sealant. Seal front and back joints.
- F. Do not locate a splice directly below a vertical mullion. Center line of D.L.O. is preferred.



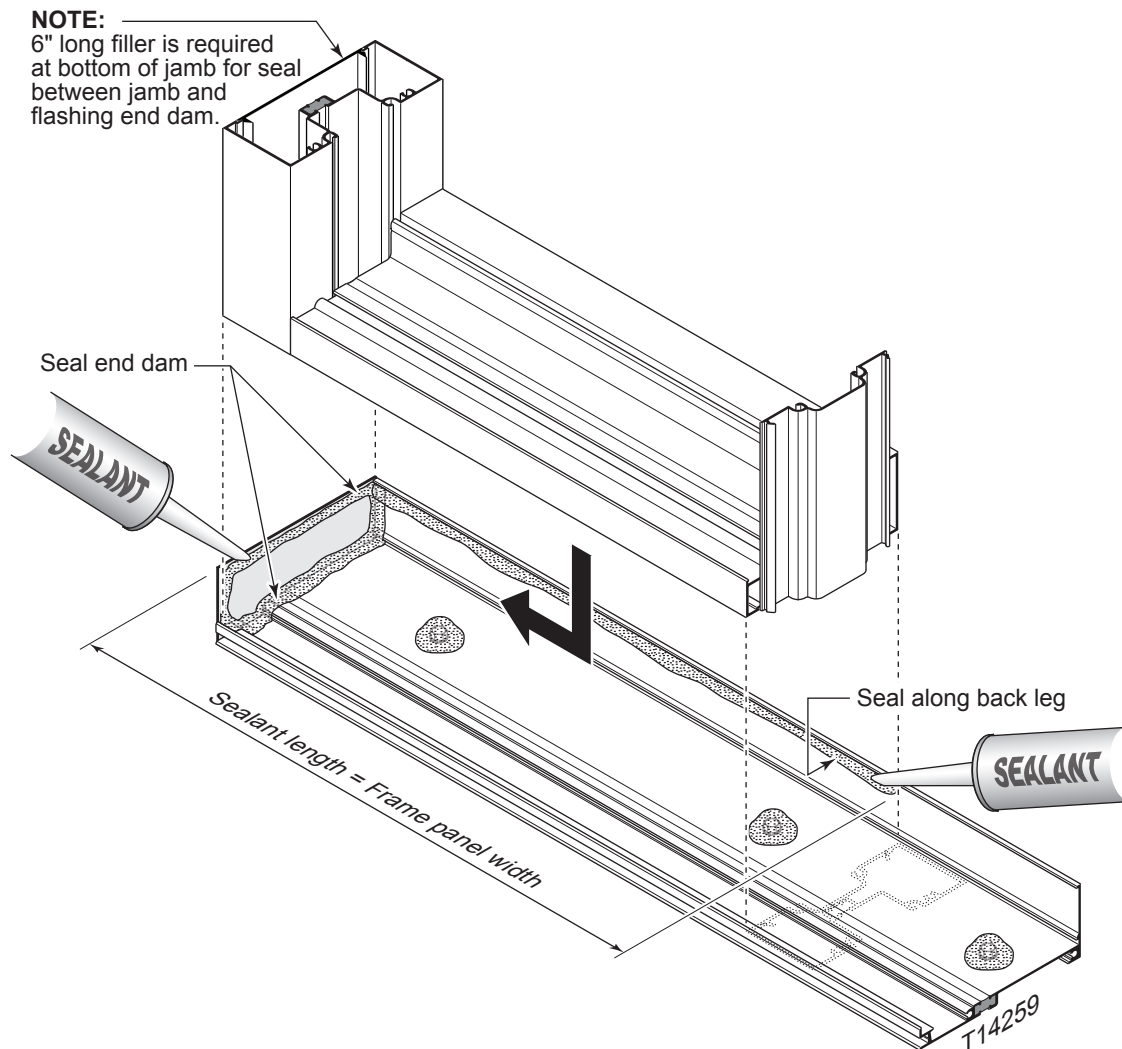
**Fig. 40.1**



## FRAME INSTALLATION

### Step 14: Install Frames

- A. Starting on one side of the opening, apply a bead of silicone to the back leg of the sill flashing and the end dam prior to installing each frame. Apply a sealant bead on the back leg of the flashing only for the frame to be installed.
- B. Lift the first frame onto the sill flashing, snug against the end dam.



**Fig. 41.1**

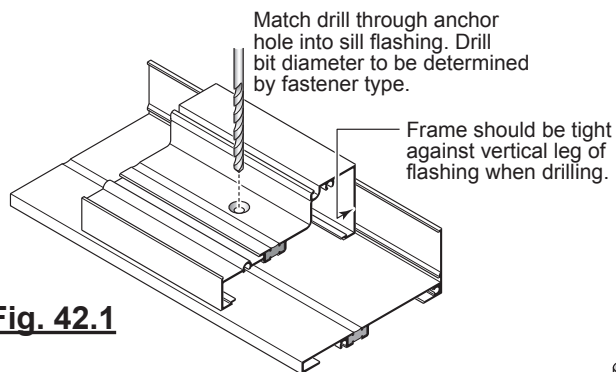
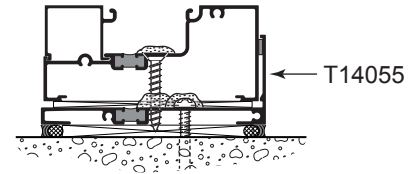
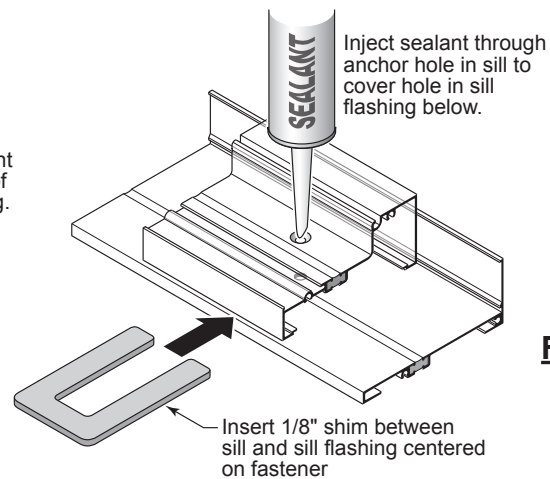
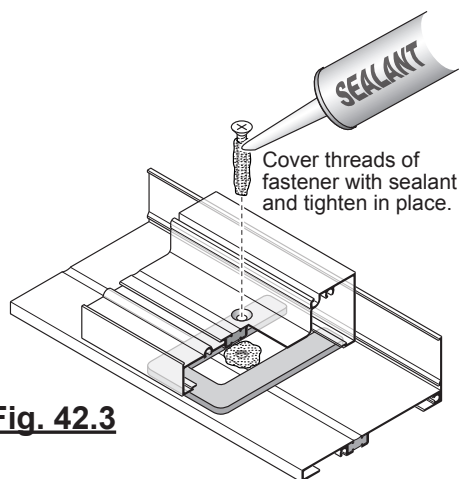
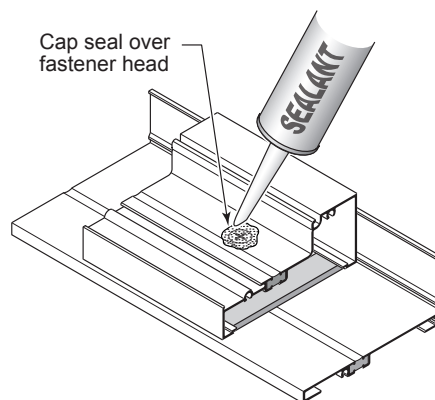
- C. Lift each frame onto the sill flashing and engage with the previous frame.
- D. Check to ensure frame is plumb, level and jamb caulk joint is per approved shop drawings.
- E. Shim head and jamb at anchor points and attach to the building structure. Size, quantity and location of anchors are per approved shop drawings. Remove shims between sill flashing end dams and secure before proceeding.
- F. When the frame is anchored to the structure, apply the exterior perimeter seal at the head, sill and jambs. Interior perimeter seal must be applied to the head, sill and jambs.

## FRAME INSTALLATION

### Step 14: Install Frames (Continued)

Frame installation when using the optional T14055 sill flashing.

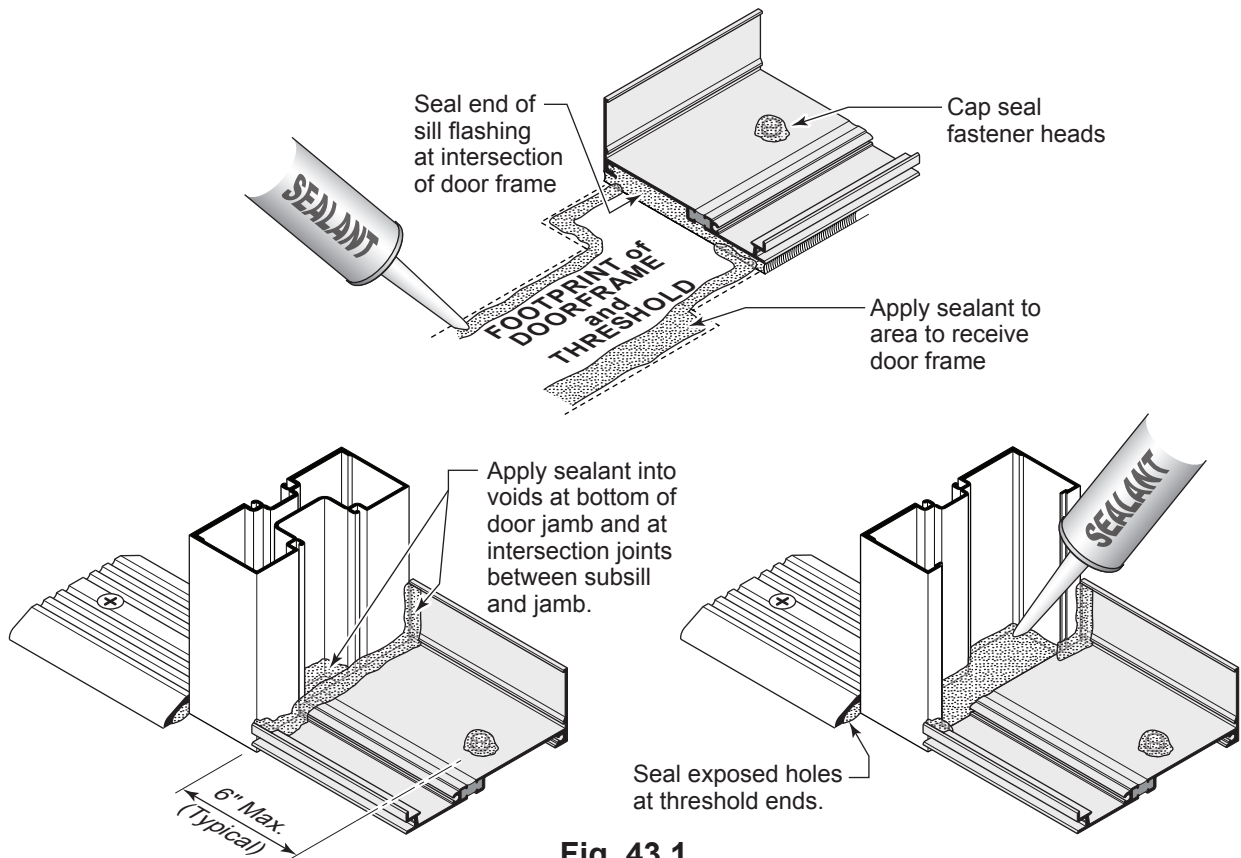
- G. Install frame units as directed in steps A and B on page 40.
- H. Push frame tight to vertical fin of sill flashing and match drill through sill anchor holes into sill flashing. See **Fig. 42.1**. Sill anchor not by Tubelite and is to be sized according to project loading requirements.
- I. Shim between sill and flashing centered on anchor. See **Fig. 42.2**.
- J. Inject sealant into anchor hole to cover hole in flashing. See **Fig. 42.2**.
- K. Apply sealant to threads of fastener and secure frame to sill flashing. See **Fig. 42.3**.
- L. Cap seal all fastener heads. See **Fig. 42.4**.


**Fig. 42.1**

**Fig. 42.2**

**Fig. 42.3**

**Fig. 42.4**

## FRAME INSTALLATION

### Step 15: Sealing Sill Flashing at Door Jamb

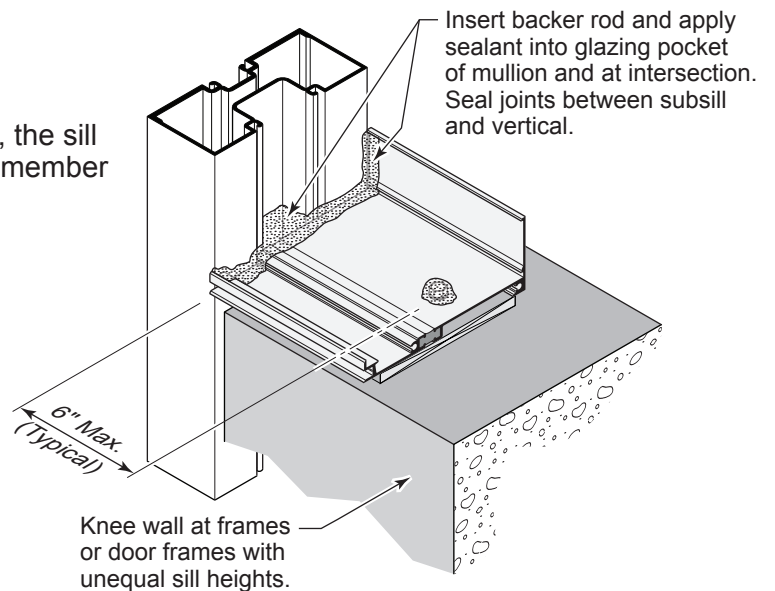
- A. Install door frame into the opening where sill flashing is discontinued.
- B. Seal the bottom of the door jamb mullion to the building substrate and to the sill flashing.
- C. Fill the door jamb cavity completely and marry to the sill flashing.



**Fig. 43.1**

**NOTE:**

When a “Knee Wall” occurs within an elevation, the sill flashing must be sealed to intersecting vertical member as shown in **Fig. 43.2**.



**Fig. 43.2**

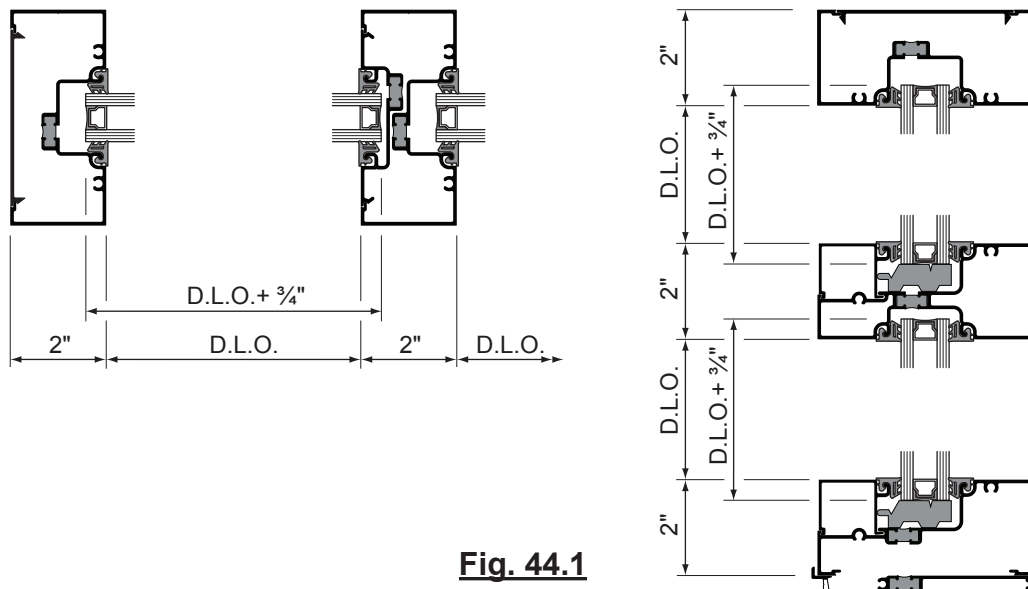
## GLAZING

### Step 16: Glazing Preparation

- A. Remove any debris from the glazing pockets.
- B. Trim excess silicone from edges of glazing units to allow for maximum glazing clearance.

Glazing pockets are designed to accept IGU's up to and including 1-1/8" thick. Refer to our online System Glazing Chart for a full list of glazing size options for this system:

[http://www.tubeliteinc.com/wp-content/uploads/2014/05/Tubelite\\_Glazing\\_Chart.pdf](http://www.tubeliteinc.com/wp-content/uploads/2014/05/Tubelite_Glazing_Chart.pdf)



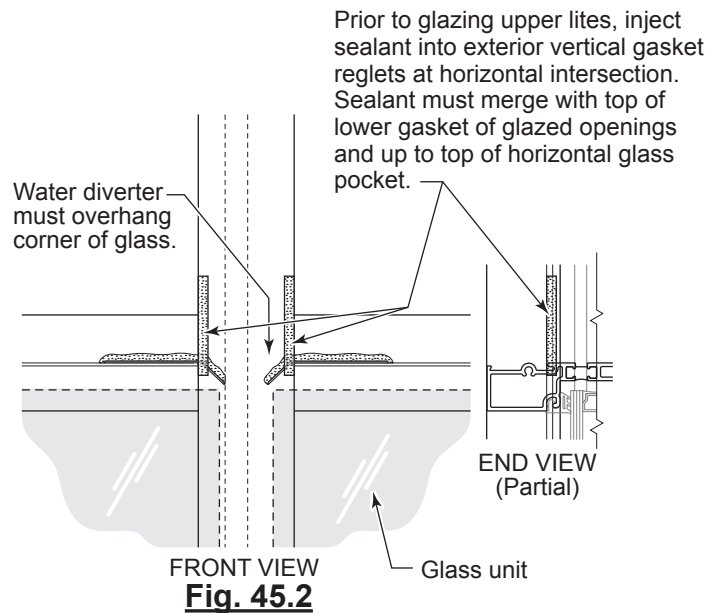
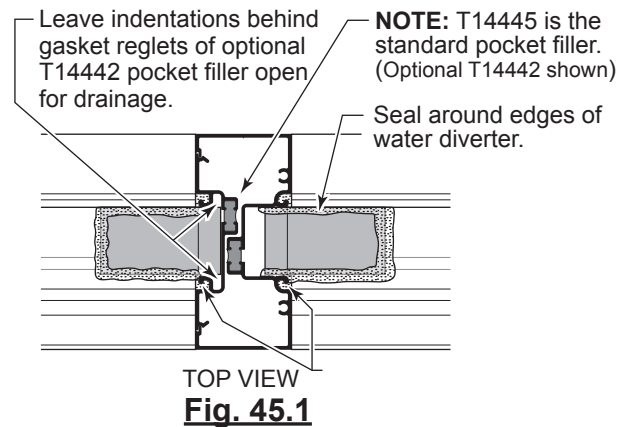
**Fig. 44.1**  
**GLASS LITE SIZES**

## GLAZING

### Step 17: Installing the Glazing Units

**NOTE:** Glazing must be done from bottom of frame up.

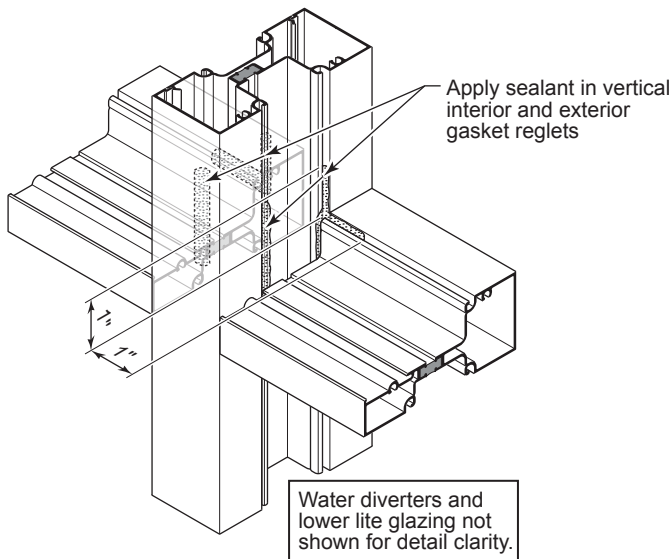
- A. Seal the corners of the previously installed gaskets (refer to Step 11, page 37.).
- B. Set the glass by installing into the deep pocket of the vertical first, then carefully sliding into the shallow pocket. Set glass onto (2) setting blocks located at quarter points or per approved shop drawings. Consult glass manufacturer if glass size exceeds 40 sq. ft.
- C. In applications where seismic activity is anticipated, install P1916 anti-walk blocks into the deep pocket side of the vertical per glazing manufacturer recommendations.
- D. Install remaining gaskets on the vertical sides of the glass, holding back at the bottom to allow for glass stop installation.
- E. Install glass stop at the bottom of the lite.
- F. Pump sealant into glazing reglet 1" away from each corner and the horizontal-to-vertical joint from the water diverter up to the glazing reglet.
- G. Finish installing gaskets at top and bottom of D.L.O.
- H. Repeat steps 17 A-G for the remaining row of lites.
- I. Prior to glazing the next row of lites, install water diverter P1135 at ends of intermediate horizontals. See **Fig. 45.1**.



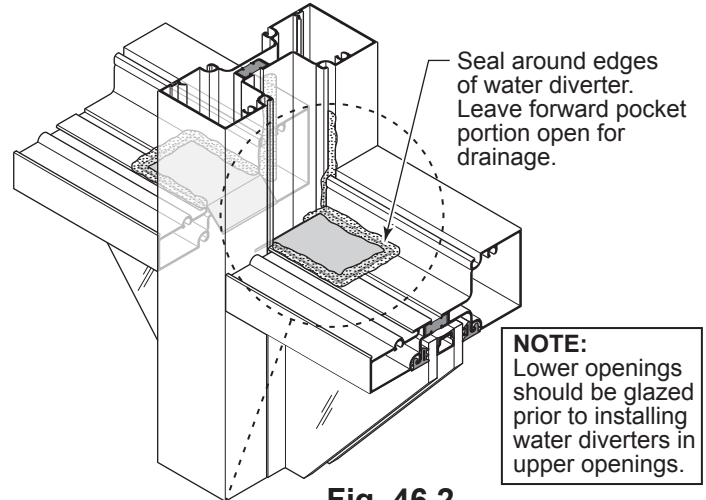
**NOTE: Position water diverter to cover glass corner.**  
 Seal diverter to horizontal, leaving the gap at the front and side open in the vertical glazing pocket. See **Fig. 45.1 & 45.2**.  
 (Also see isometric details on page 45)

## GLAZING

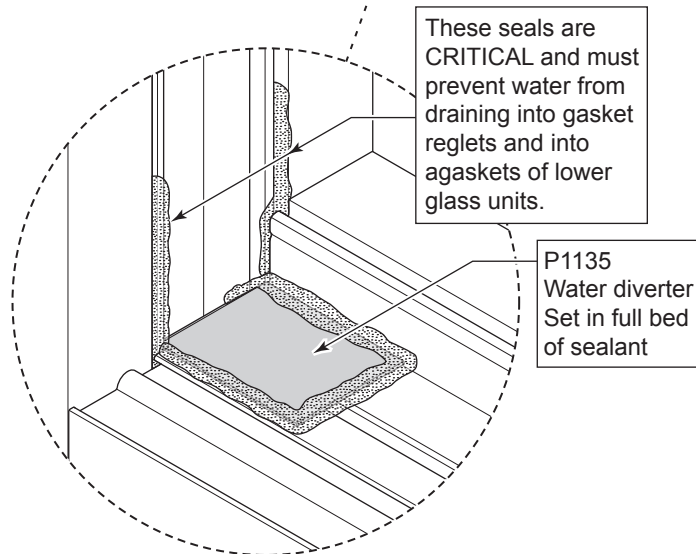
### Step 17: Installing the Glazing Units (continued)



**Fig. 46.1**



**Fig. 46.2**

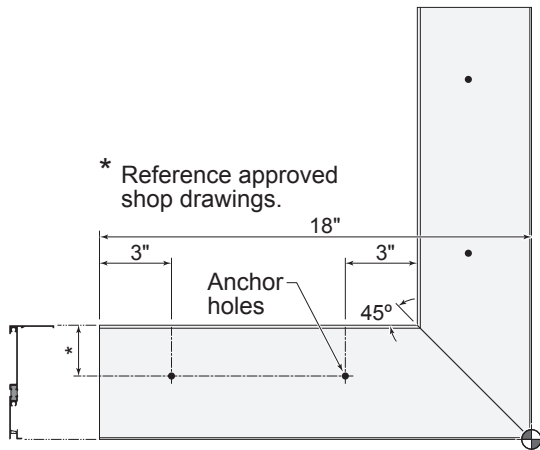


**Fig. 46.3**

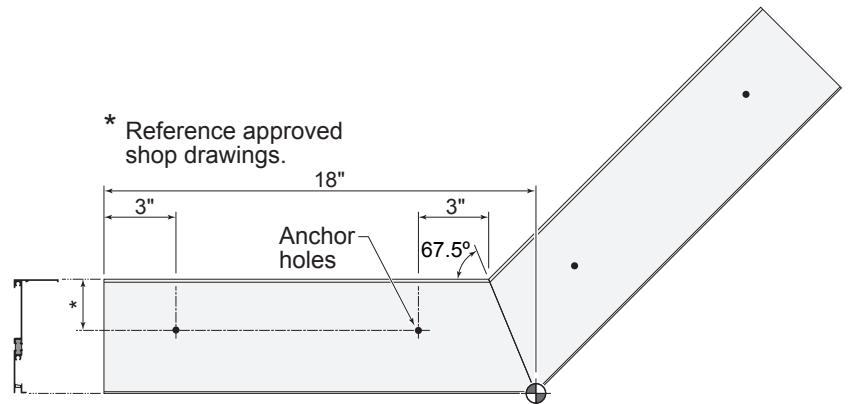
## CORNER CONDITIONS

### Step 1: Corner Sill Flashing Fabrication

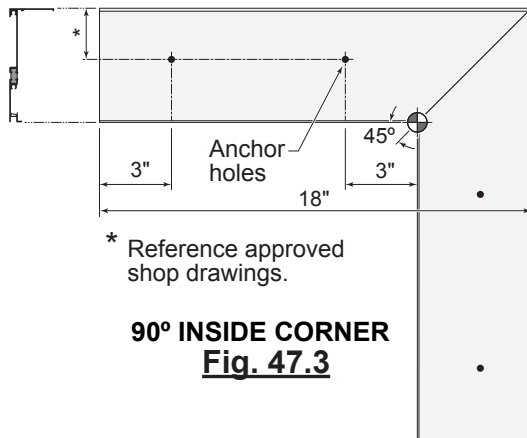
- A. Miter ends of sill flashing as shown in **Figs. 47.1, 47.2, 47.3 & 47.4.** (One left hand and one right hand.)
- B. Drill anchor holes as show.



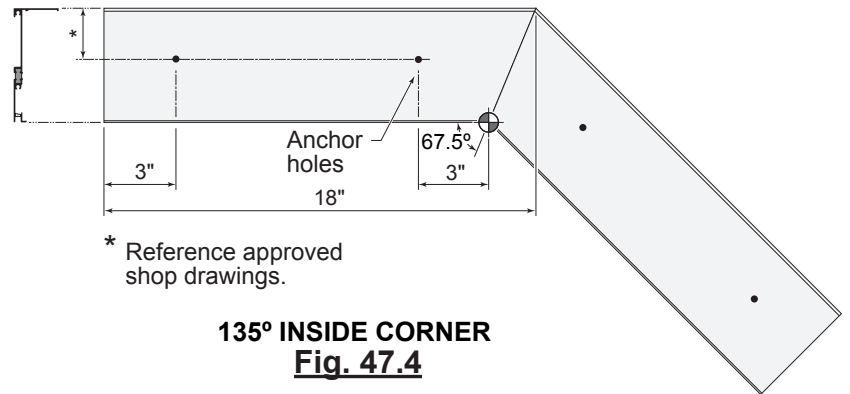
**90° OUTSIDE CORNER**  
**Fig. 47.1**



**135° OUTSIDE CORNER**  
**Fig. 47.2**



**90° INSIDE CORNER**  
**Fig. 47.3**

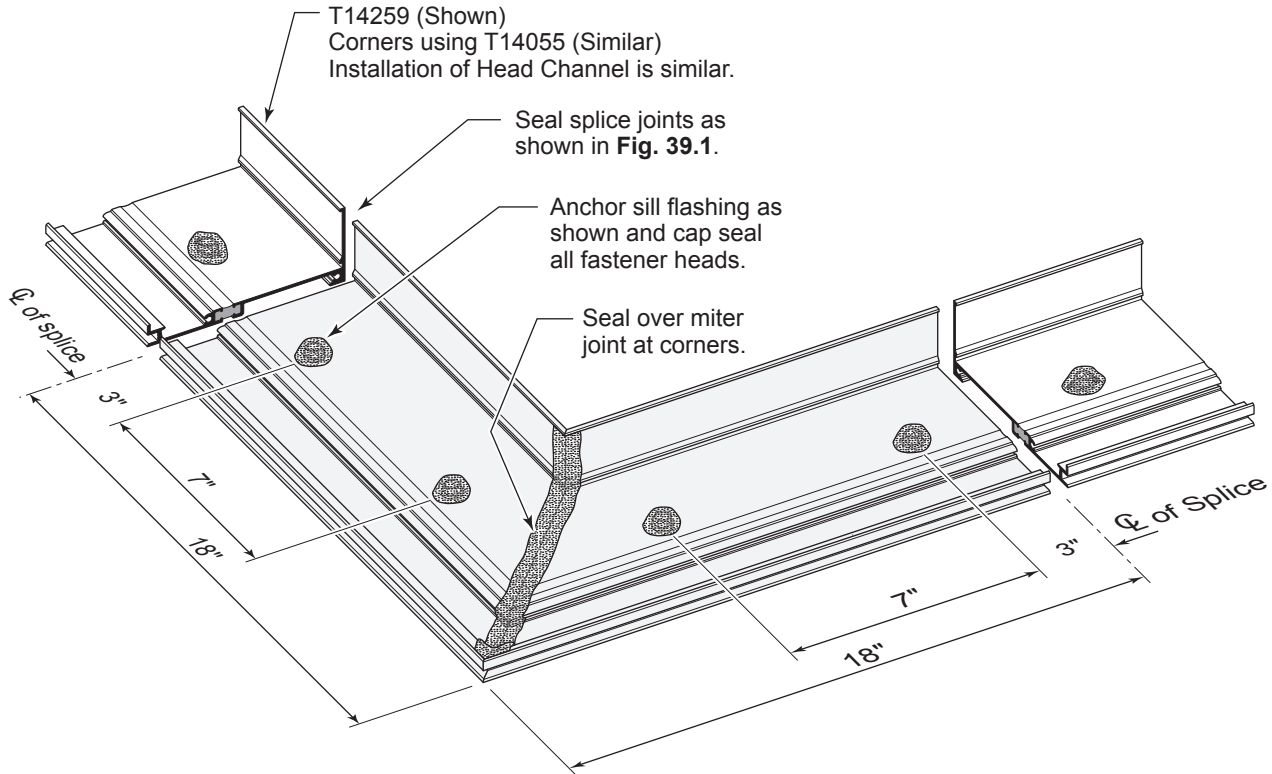


**135° INSIDE CORNER**  
**Fig. 47.4**

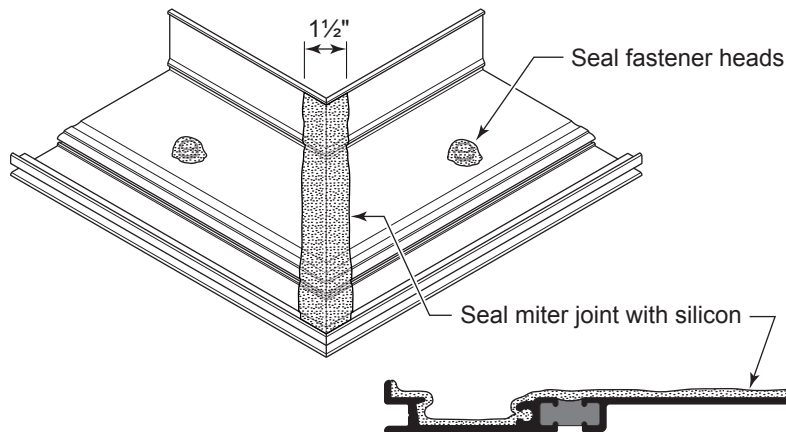
**CORNER CONDITIONS**

**Step 2: Corner Sill Flashing Installation**

- A. Install flashing corner members in place.
- B. Apply sealant full length of mitered joint. See **Fig. 48.2**.
- C. Splice corner flashing to sill flashing using procedures shown on page 39 and **Fig. 39.1**.



**Fig. 48.1**



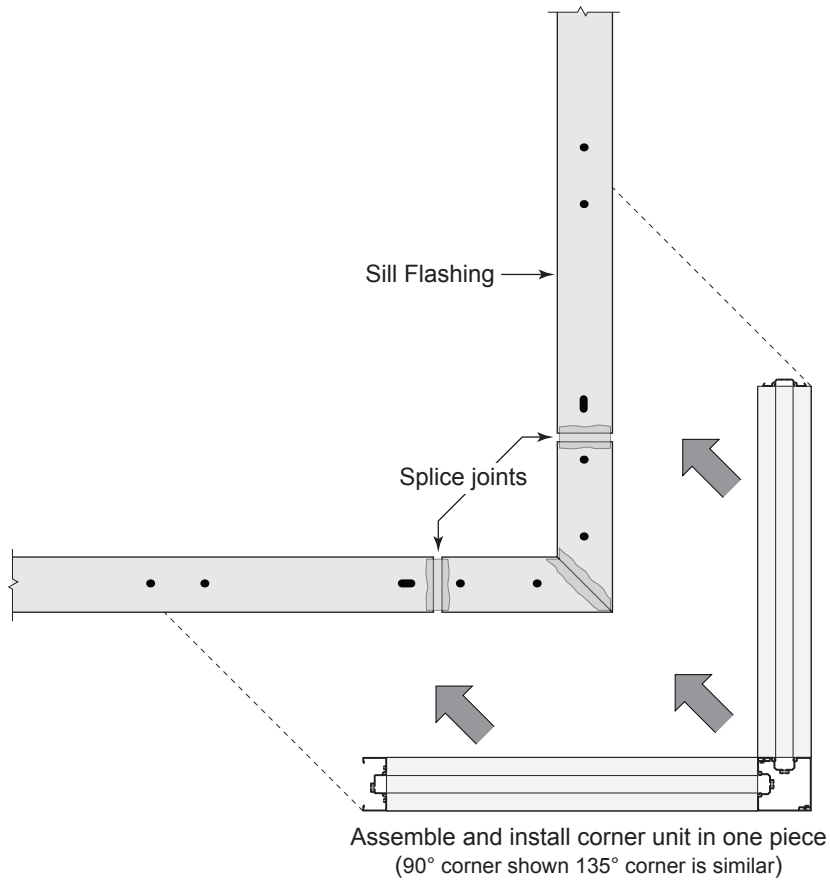
**Fig. 48.2**



## CORNER CONDITIONS

### Step 3: Assemble Frames

- A. Assemble corner bay frames as a unit and set onto the sill flashing. See **Figs. 49.2**.
- Note: For 135 degree corners, deep pocket closures must be used (E14022 or T14022).**
- B. Complete the installation per standard instructions within this manual.



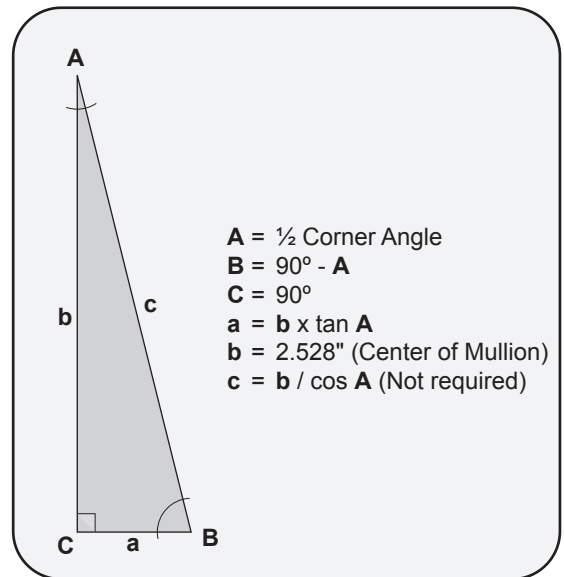
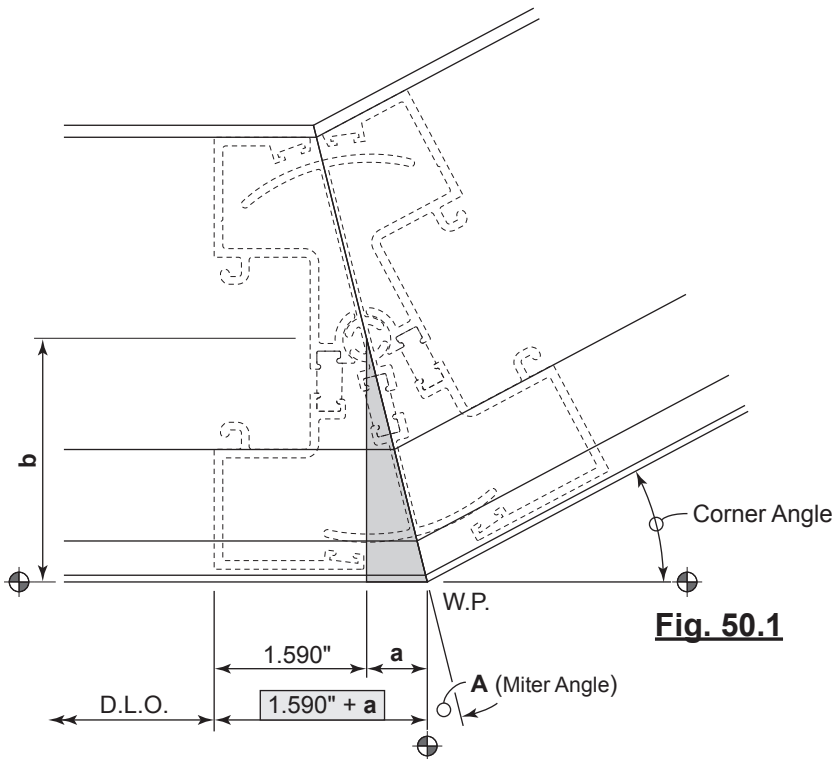
**Fig. 49.2**

## CORNER CONDITIONS

### ROTATIONAL MULLIONS

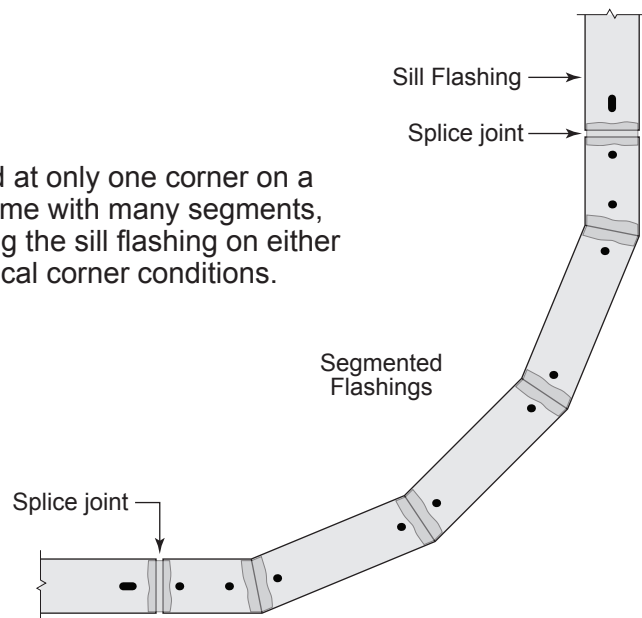
#### Step 1: Sill Flashing Fabrication & Installation

- Determine cut length of the sill flashing at the splayed condition. See **Fig. 50.1**. The sill flashing is mitered and butt tight at the corner.
- Install flashing per instructions in Step 12, page 38. Anchor the sill flashing to the building substrate each side of the corner. Seal heads of fasteners.
- Seal entire miter joint at sill flashing, tooling the sealant over the joint. See **Fig. 46.2**.



**NOTE:**

If rotational mullion is utilized at only one corner on a frame in lieu of a splayed frame with many segments, Tubelite recommends splicing the sill flashing on either side of the corner as per typical corner conditions.



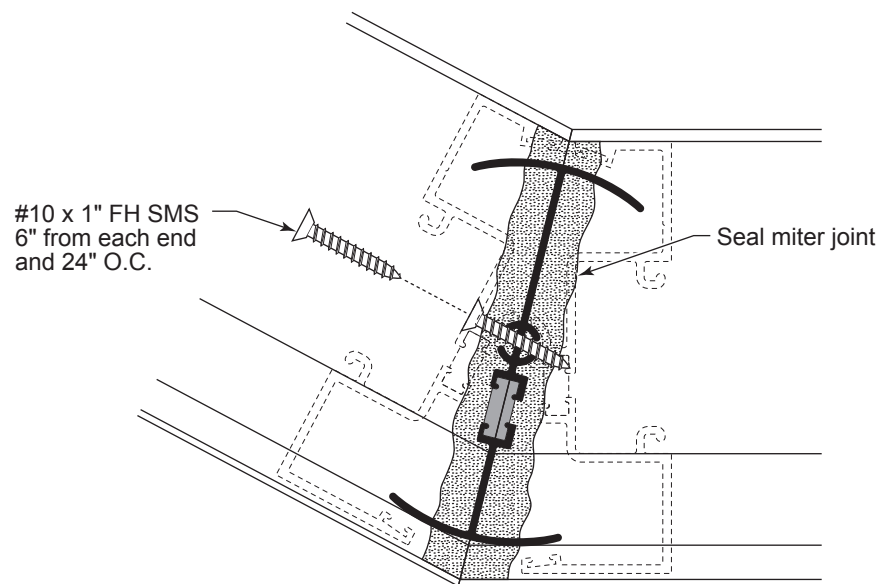
**Fig. 50.2**

## CORNER CONDITIONS

### ROTATIONAL MULLIONS

#### Step 2: Assemble Frames

- A. Install inner rotational mullion (E14247 or T14247) onto the sill flashing.
- B. Assemble frames on each side of the splayed condition. Make sure the wiper gaskets (P1221) are installed into the outer rotational mullions.
- C. Set frames into the sill flashing and against the inner rotational mullion until they lock into place.
- D. Once frame units are installed and in position, drill and countersink for #10 F.H. screw 6" from end and 24" on center. See **Fig. 51.1**.
- E. Complete the installation per standard instructions within this manual.

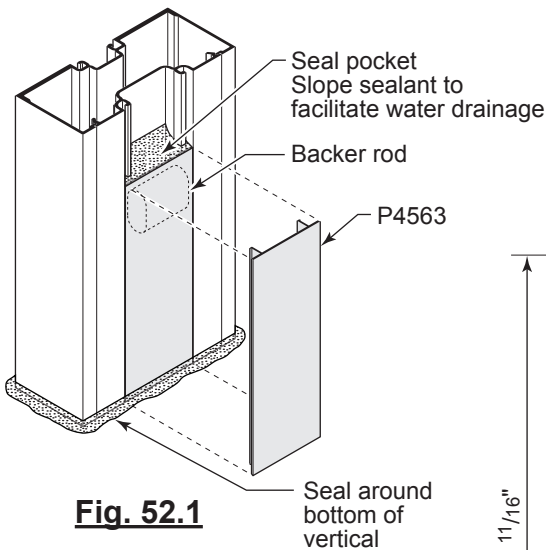


**Fig. 51.1**

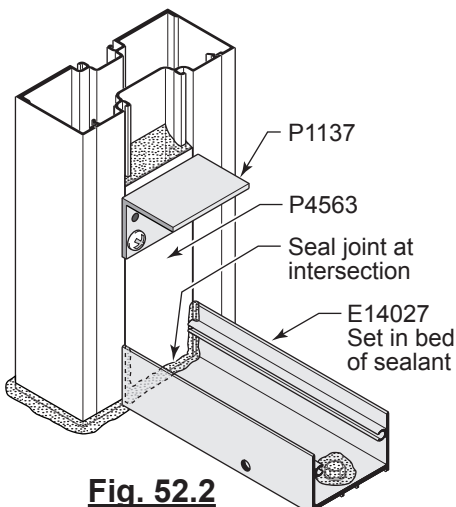
## OPTIONAL NARROW SIDELITE BASE

### Step 1: Assemble Frames

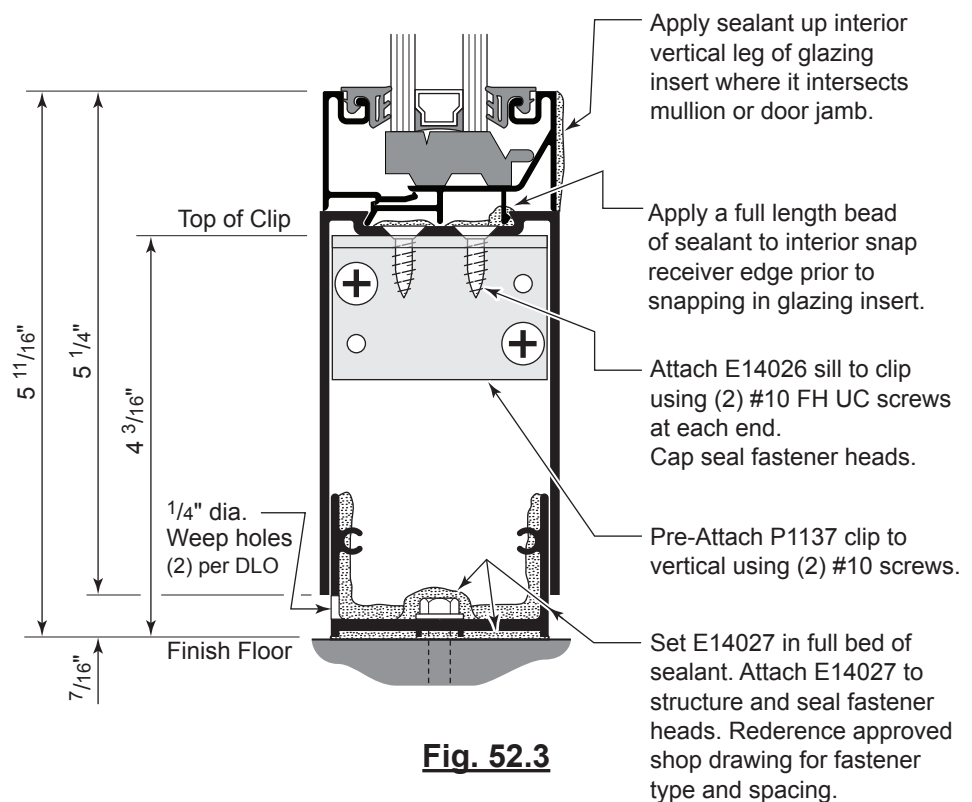
- A. Install P4563 snap-in filler at bottom of vertical
- B. Install backer rod in vertical pocket at top of P4563.  
Seal over to avoid water penetration into vertical.
- C. Drill for and attach P1137 clip as shown.
- D. Fabricate (2) 1/4" diameter weep holes in E14027.
- E. Fabricate anchor holes in E14027 as described in approved shop drawings.
- F. Install E14027 Sidelite base anchor shoe into full bed of sealant and seal ends.
- G. Slide E14026 sidelite base over anchor shoe and clip.
- H. Fasten to clips with (2) #10 FH UC screws at each end.
- I. Apply a continuous bead of sealant at interior snap receiver.
- J. Snap-in interior stop.
- K. Install setting blocks, interior gaskets and glaze.
- L. Install gasket in exterior glass stop and snap in place.



**Fig. 52.1**



**Fig. 52.2**

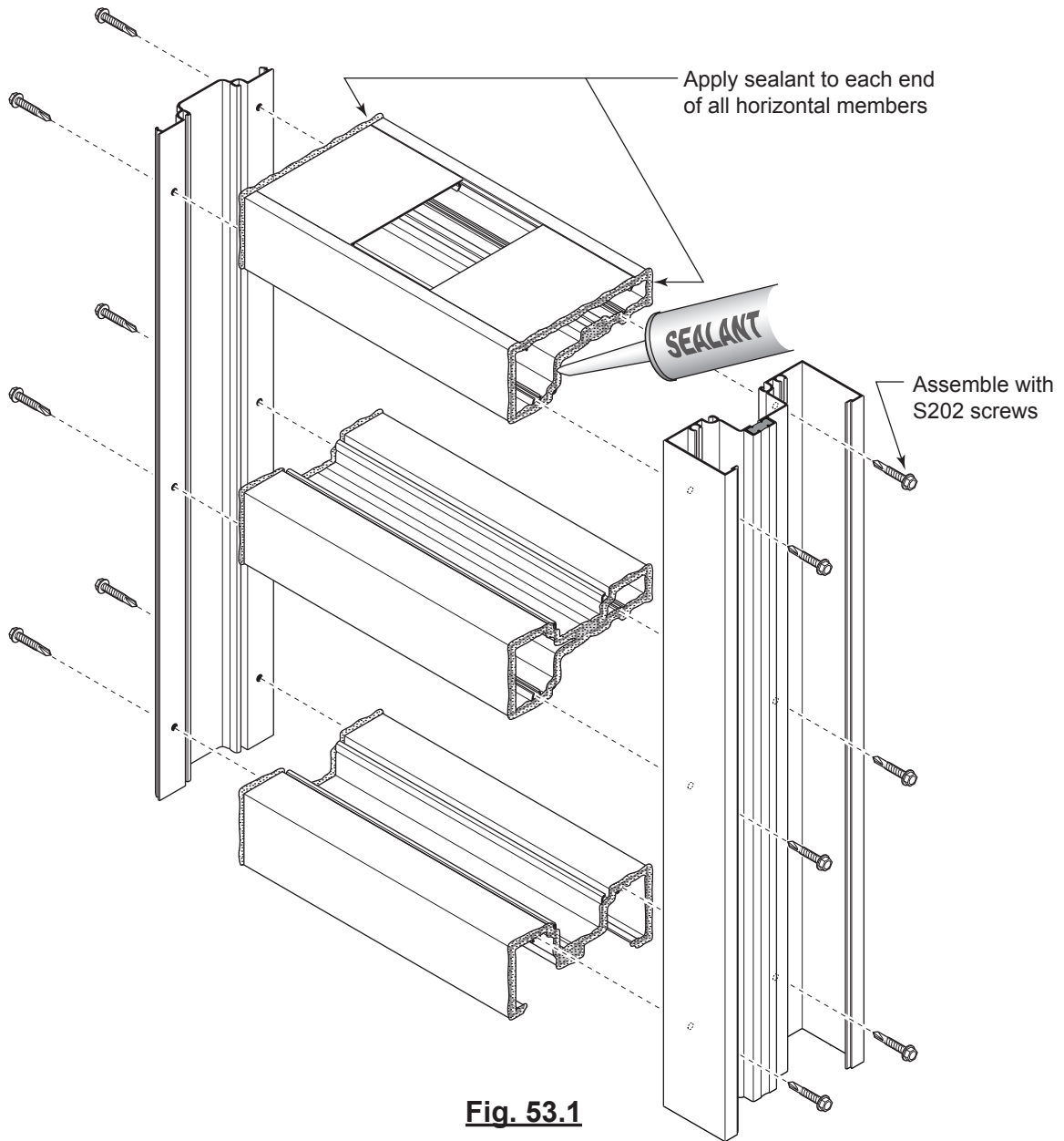


**Fig. 52.3**

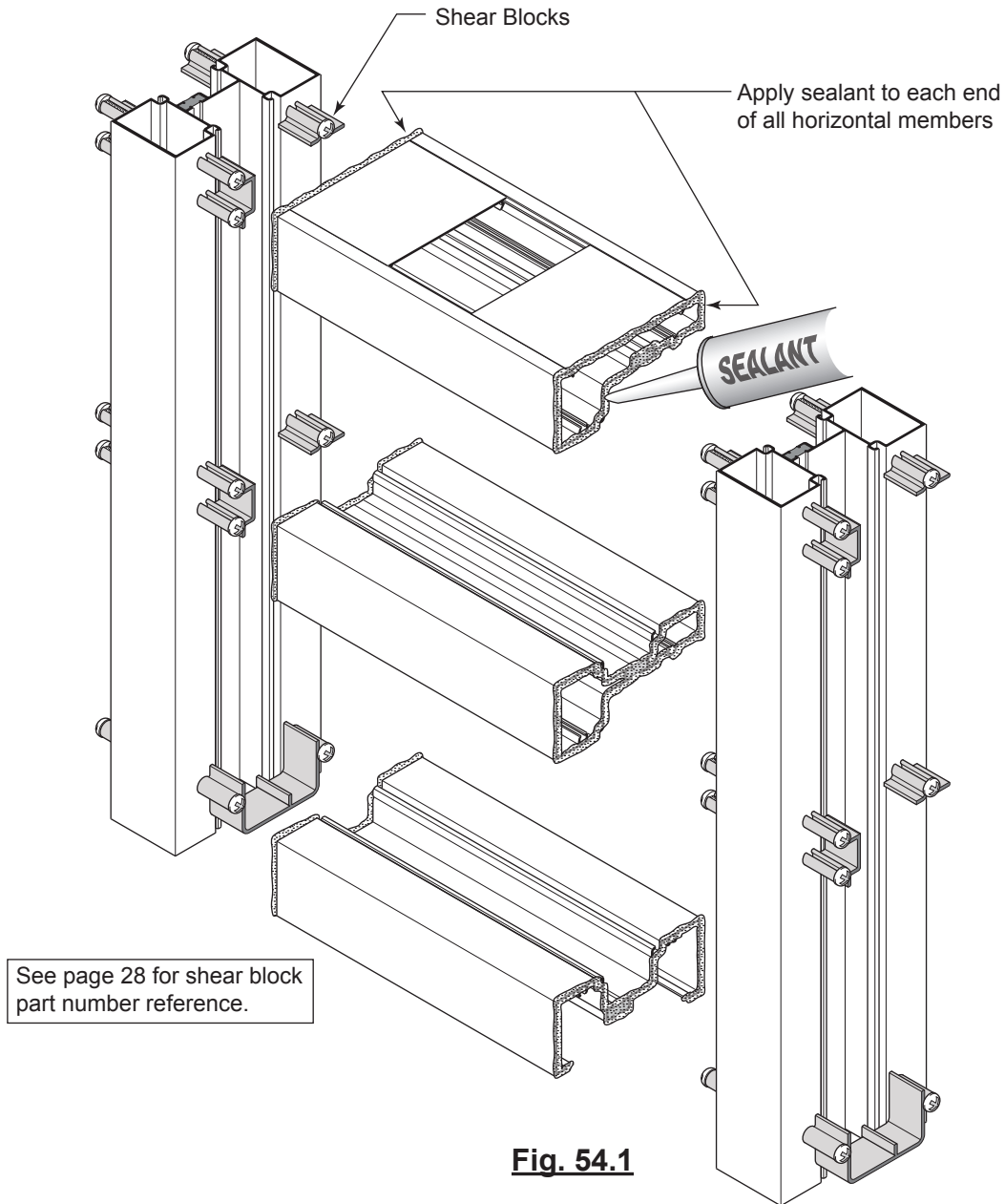
## INSIDE GLAZE

### INSIDE GLAZING GUIDELINES

For inside glazing applications, refer to **Fig. 53.1** for screw spline assembly and **Fig. 47.1** for shear block assembly. Follow standard instructions for fabrication, assembly and glazing of inside glazed applications.



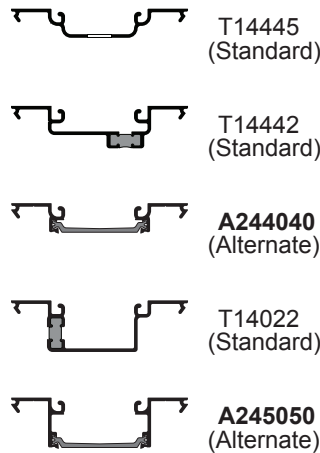
## INSIDE GLAZE



## OPTIONAL THERMAL ENHANCEMENT

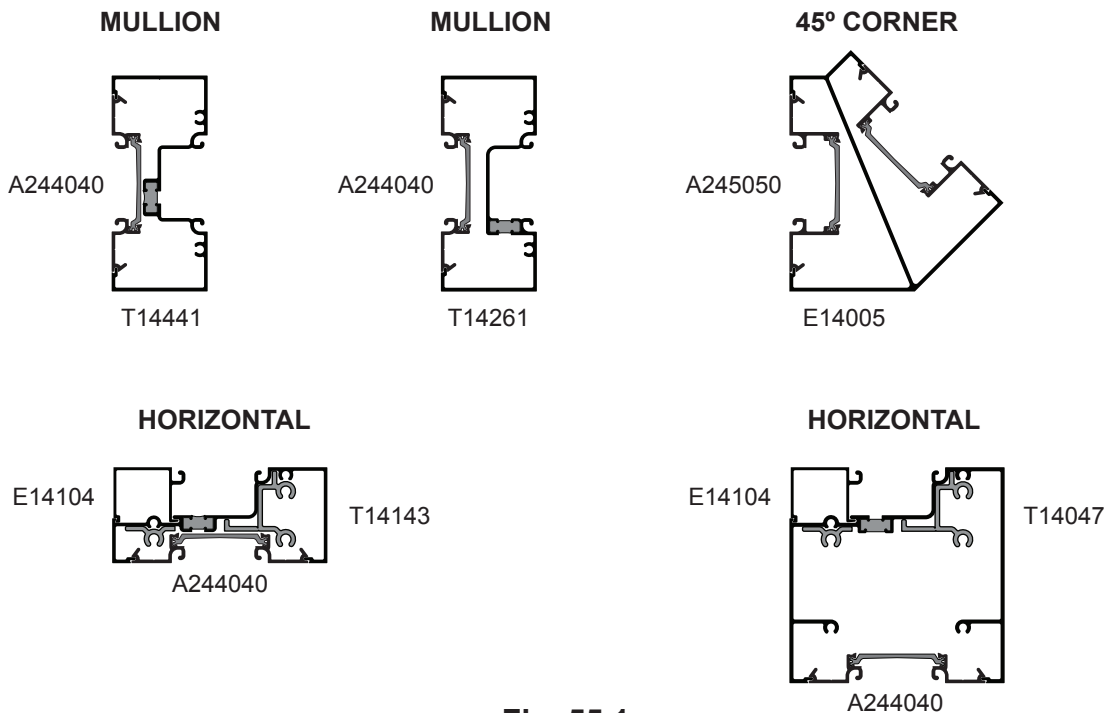
### OPTIONAL THERMAL ENHANCEMENT

The T14000 system can be modified for enhanced CRF and U-value performance by using the optional A244040 and A245050 filler as shown in the details below. Refer to our website for the most current test reports and CAD details.



**Fig. 55.1**

THERMAL FILLER OPTIONS



**Fig. 55.1**

ALTERNATE ASSEMBLIES